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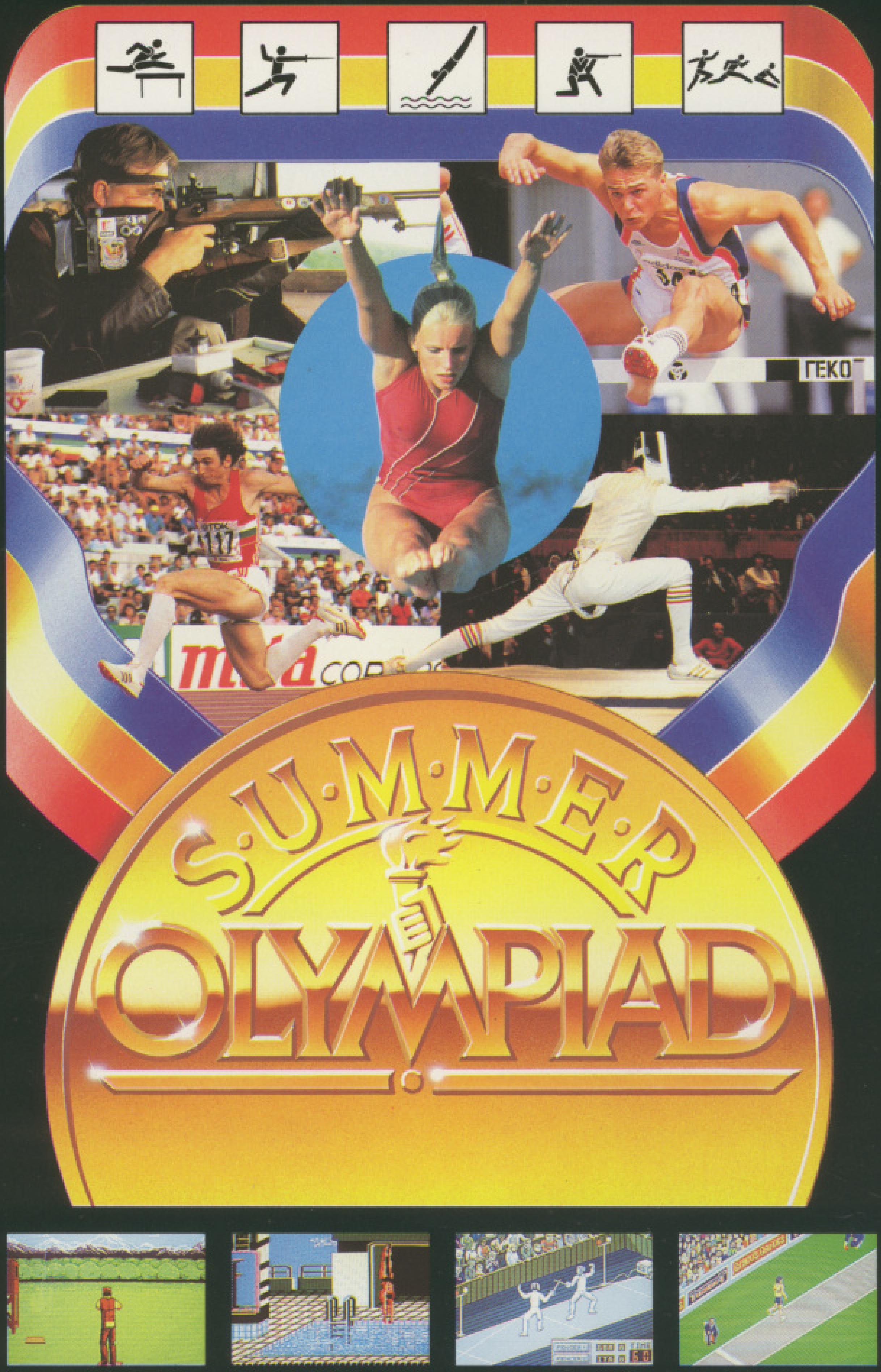
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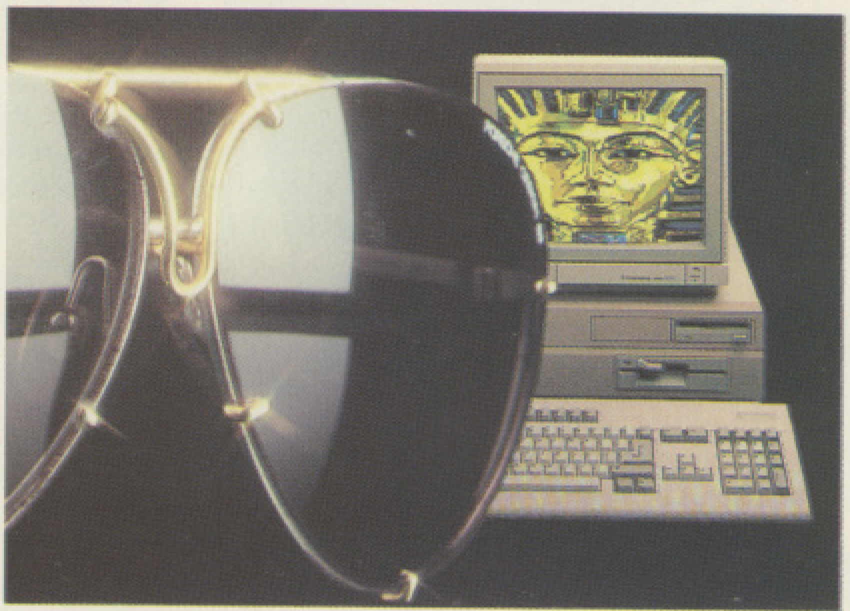
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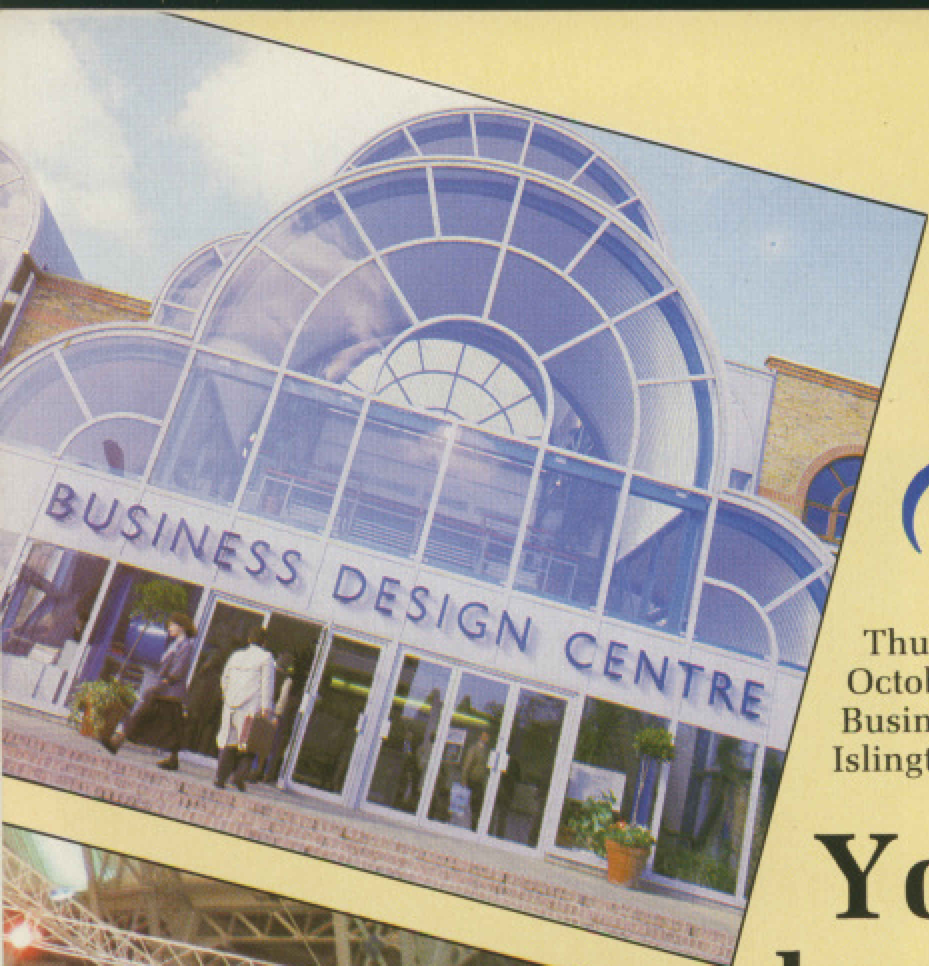
Magical Moments Page 12



FlickerFixer Page 59



A plain man's guide to CLI Page 57



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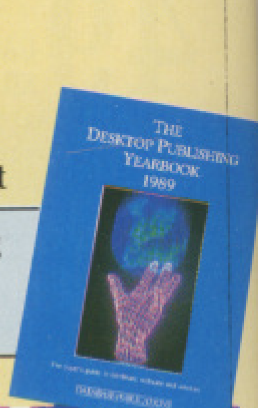
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Amiga on the Festival Fringe

AMIGA art is set to take a bow at the world famous Edinburgh International Festival.

The festival's Fringe entertainments usually involve exotic dancing, one-man orchestras, and plays where the actors outnumber the audience.

But this year, for the first time ever, computers will star in a Fringe event.

Edinburgh dealership Amiga Centre Scotland has organised a computer animation workshop and exhibition from August 11 to 20.

It will display the work of finalists in an animation competition open to every Amiga user. Prizes include an Amiga 500 and software packages worth up to £100 each.

Organiser Iain Anderson said: "The competition is open to all ages, can involve any subject and be either simple or complicated.

"All we insist upon is that the work is produced on an Amiga and submitted on disc or videotape".

There's still time to enter the competition. Entries should be sent to Amiga Centre Scotland (031-557 4242), 4 Hart Street Lane, Edinburgh, EH1 3RN.

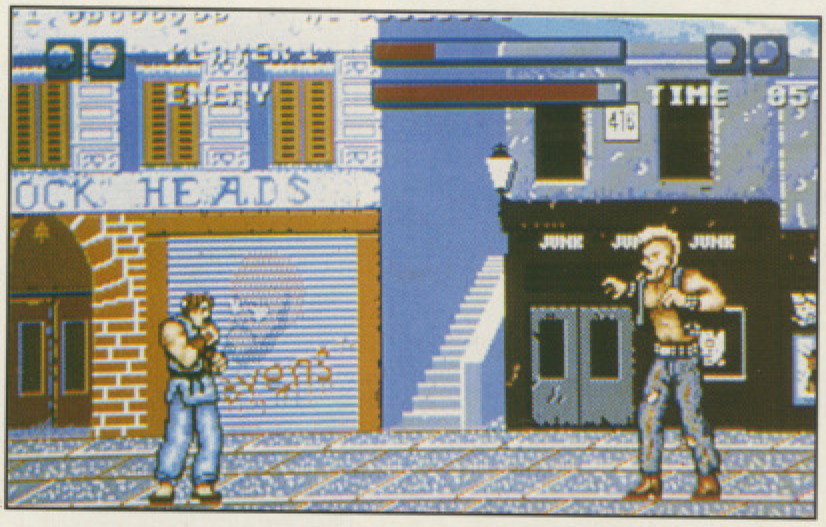
. . and doing well in Norway

REPORTS from Norway indicate a thriving Amiga community there.

An Amiga Forum for serious and professional users has been formed and had its first meeting in Oslo a few weeks ago.

And an Amiga Forum BBS has been established – as part of an existing general Amiga BBS – to exchange news about meetings, services and new products.

Founder member Per Sverre Wold-Hansen said: "Professional Amiga usage is picking up in Norway.



Sprites are getting bigger

US GOLD'S latest conversion from Capcom is **Street Fighter**, which features some of the largest sprites yet to be seen on the Amiga.

First released in the arcades nearly a year ago where it attracted a cult following, Street Fighter involves a macho vigilante flexing his muscles and fighting in various locations around the world. He takes on all manner of hard nuts including Tommy the Punk Rocker.

Street Fighter's graphics are very close to the arcade original and what's more they move at incredible speed thanks to the use of the blitter for all the screen handling routines. A Capcom spokesman claims that the Amiga version incorporates all the features of the arcade version.

Speeding a spreadsheet

AMIGA fever has gripped the folks at Digita International.

They have been working against the clock to convert their budget spreadsheet Digicalc – the first of four Digita products due out this month for Amiga users.

Written on a Unix machine and ported to the Amiga, the ultra-quick Digicalc is all in C, with no windows or Gem and will probably cost the same as the Atari ST version – £39.95.

Following hard on the heels of Digicalc will be Mailshot, a home labelling and mailing program which currently costs £24.95 for the ST and PCs.

There will also be Mailshot Plus – for business users – which can input/output Ascii files and costs £49.95. Both versions of Mailshot use wysiwyg scrolling.

Also in the pipeline is Home Accounts, a finance package that Digita (0395 45059) says is powerful enough for a small business to use. It costs £29.95 on the ST.

Digita spokesman Jeremy Rihll said: "We've been dragging our heels over the Amiga while waiting for it to build up a bigger user base so we could give it the same treatment as we've given the Atari ST.

"What has finally won us over more than anything is Commodore's own infectious enthusiasm for the machine – they've convinced us it will be a winner".

Getting organised

FIVE integrated programs to organise your appointments, notes and files are contained on WordPerfect Library, which will be released in the UK this summer.

It runs on the Amiga 500, 1000 and 2000 and has a memory requirement of 512k.

Using Calendar you can create memos and to-do lists as well as set an alarm as a reminder of meetings.

Notebook organises information into records in single line or index card format. Its auto-dial facility in the notebook requires a Hayes modem or compatible.

The Calculator program features financial, programming and scientific functions. File Manager lets you create, delete, display or print files and directories.

A Program Editor is also included which lets you create and edit Ascii text, batch and program files.

WordPerfect Library will be marketed here by Sentinel Software (0932 231164) and is expected to cost in the region of £100 to £120.

Maria leaves the scene

BARBARIAN II is coming but this time publisher Palace Software is taking no chances with its packaging.

The original game was banned from the shelves at Boots because its cover was considered too daring for family consumption.

Problem was the amply endowed figure of Maria Whittaker who portrayed the female partner of muscular Mike Van Wyk.

But this time Palace (01-278 0751) anticipates no fuss because there will be two different versions of the packaging.

One features both Mike and Maria, the other – for Boots' eyes only – dispenses with scantily-clad Maria.

Palace managing director Pete Stone told *Amiga Computing:* "Only Boots objected to the original Barbarian package and we got round that by enlarging the picture so Maria wasn't in it any more.

"This time we've short-circuited any repeat of the problem by taking two different photographs.

"But it's sad that Amiga owners who shop at Boots won't see Maria in all her glory – she's really just the sort of girl you could take home to meet mother".

Drive to make Amiga the German standard

GREGOR NEUMANN reports from West Germany

AS Amiga sales in Germany continue to go from strength to strength they are receiving a boost from the latest Commodore publicity campaign – Amiga Summer Festival.

In nearly every computer shop and department store you can test drive the Amiga, so keen is Commodore to make the machine the new standard for home computers here within the year.

An interesting spin-off to all this activity is that desktop video is emerging as a significant trend for 1988.

More and more people want to combine the two hobbies of computing and video-making, so even at exhibitions devoted to video and hi-fi, companies are demonstrating desktop video on the Amiga.

A nice example I have seen of the graphics power of the Amiga is a mobile TV transmission unit owned by COSS – the Commodore Sports Service.

Eight Amiga 2000 and nine AT clones from Commodore control the equipment that is used for normal television programmes.

The entire unit is designed as a huge computer network, where cameras, computers and recorders for the replay of pictures or pretaped videos work together.

Technicians insert text over graphics on the Amiga.

They can even mix pictures from different sources so that, with a football game for instance, the replay can be seen in the top corner while the game continues on the rest of the screen.

The computers also control databases for major sporting events such as athletics meetings and can calculate ranking lists in a few seconds.

When you see reports of German football on your television this season, look out for the Commodore logo on your screen – it will tell you that the Amiga helped to make the programme.

A few days ago Dieter Preis, head of development at the Commodore research centre in Braunschweig, told me the transputer board for the Amiga 2000 is nearly fin ished .

The hardware is up and running, but the developers have had problems with the software due to the operating system not being quite ready.

One final piece of news – a European developers' conference will be held in the first week of September near Insbruck, Austria. I hope many British-based Amiga specialists will come over to meet their German counterparts at what promises to be a fascinating event.





Ready for the rush at Commodore's impressive show

This Christmas will belong to the Amiga

THE eleventh Commodore Computer Show, held in London during June, saw the long-awaited announcement of a £100 price cut on the A500 Amiga, taking it down to meet the Atari 520 STFM in terms of price (£399.99), yet clearly outclassing it in terms of capability and value for money.

In parallel with the price cut, Commodore announced a £5 million advertising campaign to support its Amiga and PC ranges. The campaign will have broken in the UK media by the time you read this.

"It's just the beginning of a massive marketing investment by Commodore in the UK market this year", said Dean Barrett, Commodore UK's marketing manager.

"Our biggest advertising campaign ever breaks this summer and we shall be announcing further initiatives in September".

Steve Franklin, Commodore UK's managing director, told *Amiga Computing* that prices on the A500 should drop immediately, no matter where the dealer is in the UK.

"We've offered price protection to all our distributors, so they will look after the dealers", he said. "The price places the A500 in a very strong position indeed".

Elsewhere at the show, Ariadne Software was busy showing off its new Ariadne Amiga Application Environment (AAAE) package. The £850 system (£500 for the Microtext authoring software, £350 for the hardware) allows any Amiga – A500, A1000 or A2000 – to control a laser disc player or 9000 series U-Matic video recorder for interactive video display applications.

According to Hanifi Houbart, an Ariadne software consultant, AAAE allows frame-by-frame control of any suitable video source so that pictures can be mixed, edited and even chained together in real time.

COMMODORE had an impressive stand which dominated the main hall. Steve Franklin of Commodore told us that this is just the top floor of a pyramid they will have at the PC show in September. A couple of new products were shown on the stand – an expansion box for the PC-1 IBM compatible machine and the A2300 genlock for the A2000.

There are also a few new products in the pipeline, including the A590 hard disc

and 2Mb expansion box for the A500. Kristian Anderson, head of Commodore Europe, said that he hopes to see it in England towards the end of the autumn, but fears that it will be quite pricey.

Overall conclusions of the packed three day event? The Amiga will sell and sell at its new £399.99 price point. Commodore has declared an intention to make 1988 an Amiga Christmas, and it's certainly laid some very solid foundations.

OVER on the Trilogic stand interest was high in Print Link, a £34.99 printer interface to allow Commodore 64/128 printers to be used with the Amiga. Included in Print Link's specifications is a 64k printer buffer – excellent value for money.

THE Disc Company, a relatively new face in the UK software industry, unveiled Kind Words, a word processor for the Amiga, at the show.

Despite its budget price tag of £49.95, Kind Words is a powerful application with the ability to mix text and graphics, and includes a 90,000 word spelling checker with a wysiwyg interface. The package has been on sale at $99.95 in the US, where it has received rave reviews.

"Now we're launching Kind Words in Europe", said Howard Marks, the company's managing director of international operations. "The reason for the package's budget price is that we have great plans for Britain and Europe, hence the low price to establish a major presence in the Amiga software market".

From the short time that *Amiga Computing* had for a hands-on session with the package running on the A500, Kind Words proved to be a very powerful word processor indeed, yet its easy menu-driven options allowed us to glide through the package in no time at all.

UK distribution of Kind Words is being handled by The Amiga Computer Centre in Scotland (031-557-4242). The package is also distributed at a similar price in Sweden and Norway. Other European native language versions will be available shortly.

CROWDS also gathered around the Mandarin Software stand, which was busy promoting Time and Magik on the Amiga. Three of Level 9's acclaimed adventures – Lords of Time, Red Moon and The Price of Magik – have come together as an adventurer's delight at a surprisingly low price for an Amiga program.

"At £19.95, Time and Magik has to be the best value for money package available on the Amiga," said Chris Paine of Mandarin. "Interest – and sales – of the package has been very high at the show," he added.



There was new software galore at the show



Faster printer drivers on latest Workbench

JIM BUTTERFIELD reporting from Canada

THE recent Amiga Developer's conference in Washington, D.C. was a great success.

So much so, in fact, that Commodore is rumoured to be planning two more in the immediate future. One is planned for Europe.

Highlight of the conference was the imminent Workbench 1.3 system. Commodore has somewhat loosened the veil of secrecy, and seems to be allowing hints from sources previously sworn to silence.

The new 1.3 system can be summarised with the words cleanliness and comfort. Most of the known bugs of 1.2 have been cleaned out – and there weren't too many of those – and a number of user convenience features have been added.

Many of these seem to be adaptations of support systems already in the public domain. Screen editing, sorely missed by former Commodore 8 bit users, will be implemented as part of a CLI shell.

Text speedup, via program FF by Charlie Heath of Microsmiths, will be part of the package. Some popular CLI commands can be made resident to allow them to be used without needing to be brought from disc.

There are numerous other features, but perhaps the one that brings the most immediate delight is the vastly improved printer drivers. They are faster and better, and there seem to be more of them. Some of these have already been leaked to users, where they are getting favourable response.

It's generally expected that Commodore will make this upgrade inexpensively available to current users, as the company did with its 1.2 Enhancer kit. It's quite a worthwhile upgrade, and I recommend it when it comes. It will keep your system in tune with the current product line.

What can you do to keep yourself in the mainstream while you're waiting for 1.3? Ease yourself into these future developments with currently available public domain or shareware systems.

For screen editing, try Shell by Matt Dillon – be sure you get version 2.07 – or ConMan by William S. Hawes. FastFonts (program FF) is in general circulation. These will give you an idea of some of the goodies waiting for you in the new system.

There's a group in New England, under the direction of Scott Ballantyne, working on a completely alternative set of CLI commands. They call their project ARP (Amiga Replacement Project) and its main objective is to bypass the Dos system with its strange pointers and virtually undocumented inner workings.

They have made great progress with this, and have generated an extensive set of ARP commands which match favourably those of "normal" CLI.



THESE are the first screen shots from the soon to be released Amiga version of Advanced Dungeons and dragons adventure Pool of Radiance.

As this issue of *Amiga Computing* went to press the finishing touches were still being applied to the fantasy role-playing program.

Still to be decided was how many discs the Amiga version will require – two is the likely number – and a price has not yet been fixed, although we understand 16-bit versions will cost £24.99.

The game is a product of collaboration between Strategic Simulations and TSR Inc and will be marketed here by US Gold (021-356 3388).

Pool of Radiance is set in the huge complex world of the Forgotten Realms and SSI promises its graphics will test even the Amiga to its limits.



A scene from Pool of Radiance

ON THE GAMES FRONT

Fire and Forget is a newie from Titus and Entertainment International. War threatens to destroy the world and unity must be restored to avert a nuclear holocaust. The government has selected you to be the driver of Thunder Master, the ultimate fighting machine.

Fire and Forget is yet another car racing game, involving elements from the new brand of progressive car racing games like Roadblasters.

So if you can see yourself taking control of Thunder Master and preventing nuclear war, pop down to your local software shop in early August.

Fire and Forget is being programmed by the same stable that brought you Crazy Cars, so expect slick graphics and imaginative sound.

The problem of limited gameplay evident in Crazy Cars certainly won't afflict Fire and Forget as the programmers have made a special effort to carefully design the games plot and make the best use of the Amigas coprocessors.



It's all action in Thunder Master

Another Entertainment International title is **Better Dead than Alien**, this time on the Electra label. This wonderfully titled game represents a first in Amiga software for Elektra, a new software company. It is based upon the daring antics of Brad Zoom in his quest to save civilisation. You can join Brad and wage war against hoards of aliens sometime soon.

The game is being programmed by Oxford Digital, responsible for the well received Hunt for Red October. The bad news is that it will for the most part be a port from the ST as a spokesman from the company suggested that both the Amiga and ST versions were being developed on the ST. However audio improvements will be made on the Amiga version.

Mortiville Manor, from Lankhor was first released on the ST more than six months ago in France where it was most favourably received, featuring as it does encounters with characters in real time. If Mortville Manner sounds like you then get the francs ready for early August.

Although it first appeared on the ST, the programmers have rewritten the game from scratch and made the most of the Amiga's extra features.

The video promotion demonstrates that the speech is outstanding, making the best use so far of the Amiga's internal speech chip. The graphics look first rate though a little slow in the redrawing department, and the sound throughout is very atmospheric.

Over in West Germany, which has provided some of the more "hacker" orientated software over the years, new games have been announced.

Tron 5000 is, predictably, a clone of the Tron arcade game. The graphics are good but the game lacks music – the sound effects are merely adequate.

However, the high standard of gameplay makes this one to look out for.

Bomb Busters is a disappointing Bombjack clone, coming nowhere near the standard of Tron 5000. The graphics, which could have been as good as the arcade game, fail to come close.

The gameplay is another failure: Everything happens too slowly and Bombjack without the fast action just isn't worth the disc space.

Across the Atlantic there have been three new game releases:

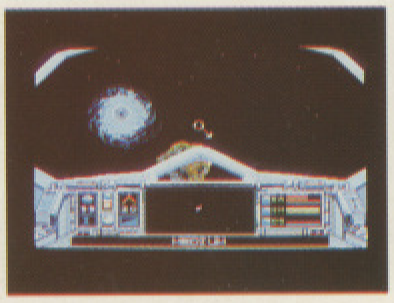
Romantic Encounters from Microillusions is hot and may even take Faery Tale's crown. It is presented in the same manner the earlier epic but has superior graphics and a more interesting storyline.

The two strategic games, **Kamfgruffe** by SSI and **Ultima VI** by Origin Systems, display improved graphics over previous releases, Ultima VI being well worth the anticipation building up inside fans of the Origin series.

Kill or Die is the product of teamwork, the most famous member being Carlos Texera, one of the artists who worked on some of the earlier Cinemaware releases.

Kill or Die is based along the commando theme, featuring great sound and graphics – a tribute to a game written entirely on the Amiga.

The Amiga scene is really hotting up. Expect it to reach boiling point by Christmas helped by a massive, 1Mb only, role playing game from American software house Epyx.



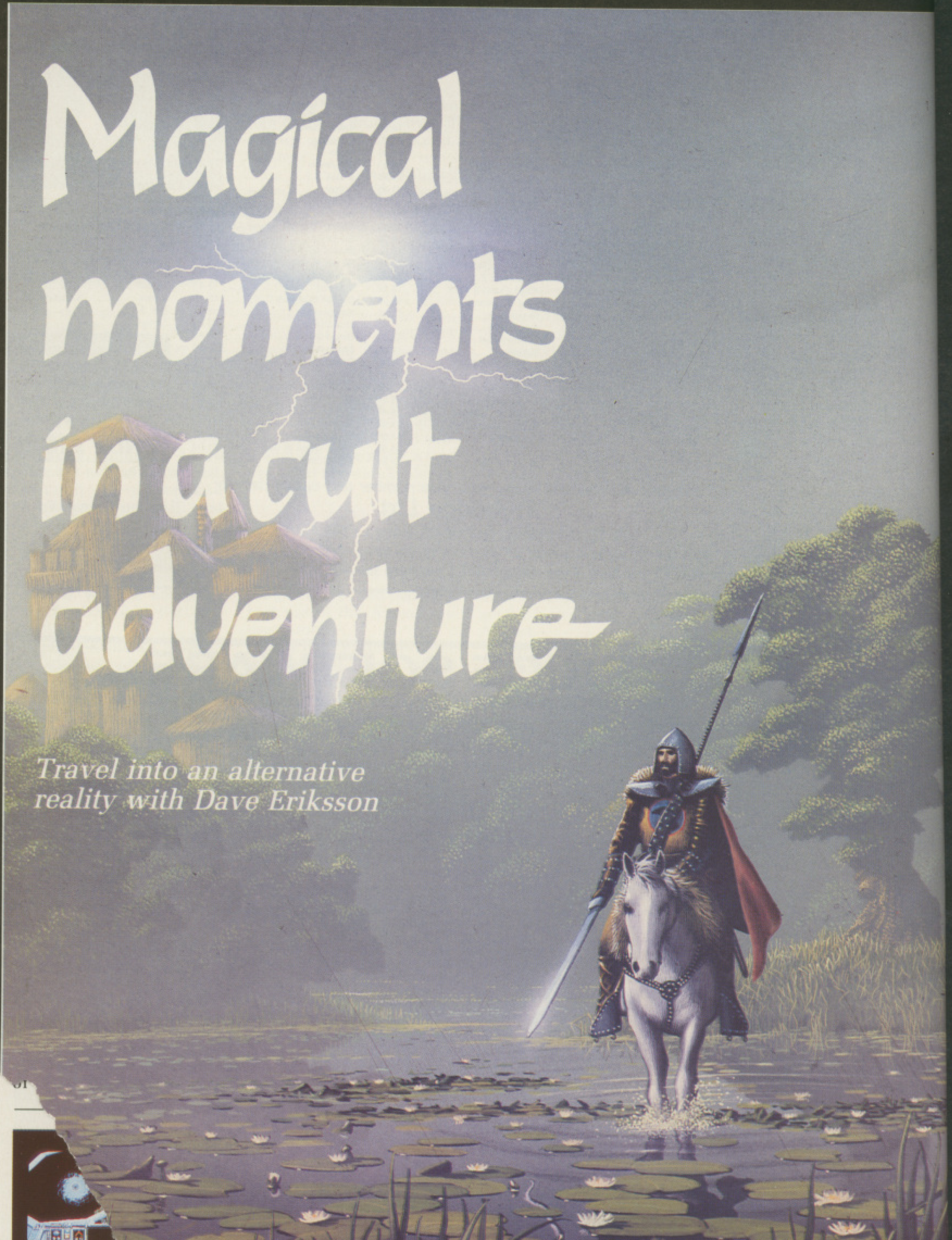
THESE pictures show two games which will shortly be released by Electronic Arts.

Skyfox II is a space age sequel to one of the very first Amiga games. World Tour Golf lets you play a round without leaving home.



Magical moments in a cult adventure

Travel into an alternative reality with Dave Eriksson



GRANDSLAM Entertainments, previously Argus Press Software, now has a link with Datasoft in the USA to distribute the role-playing game Alternative Reality which has a cult following over there.

The plot is simple: Kidnapped by aliens and deposited in a strange city, you must learn to survive and become an adventurer capable of completing the quests in store.

Entering the city of Xebec's Demise, you pass through an energy field over which are a series of scrolling numbers. These represent your vital statistics, stamina, charm, strength, intelligence, wisdom, skill and hit points.

Some numbers scroll quickly and it is not easy to time your entry to ensure a viable character. If the stats are too low, start again. Aim for high stamina, strength and skill and no stat less than 14.

You enter the city with a few coppers, some light clothing and your wits – nothing else. To survive you must eat, drink and find shelter. All cost money, perhaps earned by working at a tavern, inn or bank.

A few coins may also be found after successful fights with the local inhabitants. Creatures met may be good, neutral or downright evil – listen to the music as they appear. Do not attack the first two without provocation.

Initial fights will be with your bare hands, but weapons and armour are for sale at four smithies. There are also shops that have clothes to suit any occasion. Bargain to reduce the asking price to a more affordable level.

IN a fight, hits received will be subtracted from your hit points. You get experience points if you kill your opponent. Gain about 250 and advance a level, after that you go up a level for each doubling of experience points. With each gain in level your hit points are increased, together with the probability of increasing one or more of your stats.

In odd corners around the city are 12 guilds. On your first visit to each one of your stats will increase. You may try to join guild, and if accepted will be taught their spells, which range from controlling the weather or healing, to changing your stats or throwing fireballs.

The stats set for you at the start include several that are not displayed. These include speed, moral alignment, treasure finding ability and whether you are easily noticed. Some stats will increase as you use them.

You start with neutral moral alignment; how you behave decides which way this will develop. The game is designed to be more difficult for an evil character, but it is not always easy to be good.

You have a choice of six actions when a creature is encountered – attack, trick, charm, offer, leave or lunge. Tricking or charming a good or neutral character is considered an evil act, but it is well worth trying on an evil one if it is intelligent enough to understand what you are doing.

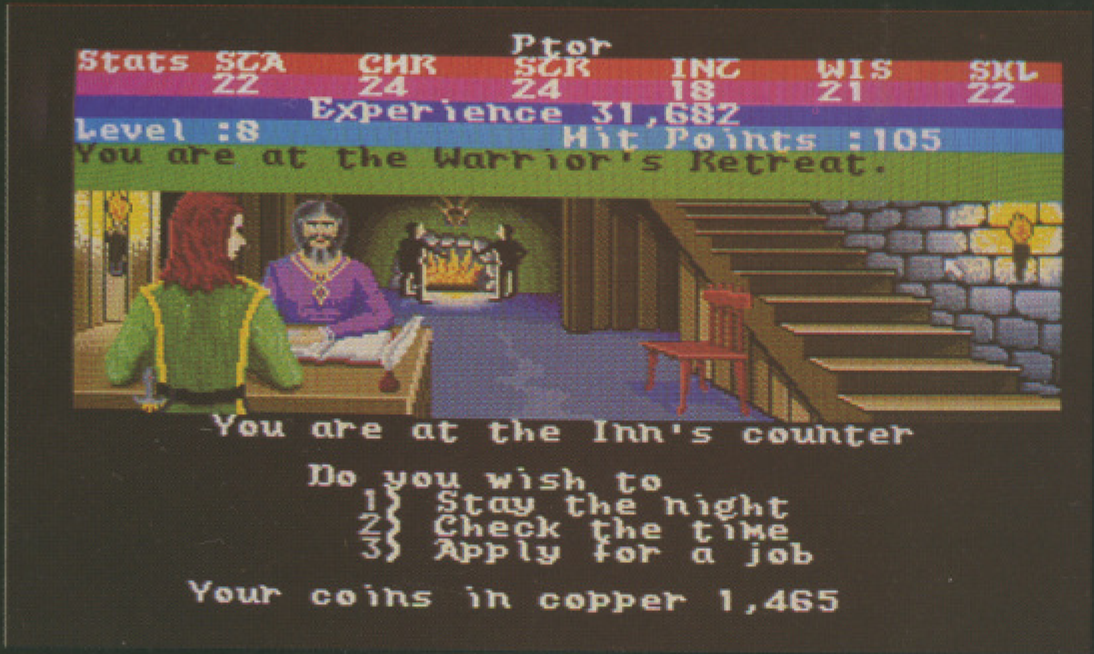
Certain life forms carry diseases or inflict poisoned wounds, If infected, you had better know where the nearest healer lives. There are two and their services are not cheap – each additional request or visit on any one day puts up the price. If you think you need curing it is worth asking for a cure rather than a diagnosis; the subsequent cure, if needed, will cost twice as much.

Defeating an opponent does not always mean that you will find anything useful. Money is the most likely loot, but gems, potions, weapons and armour are always welcome sights after a fight.

Objects found may be either good or bad. Potions may increase your treasure-finding ability or poison you. A sword may have useful magic or it could be cursed. Potions may be tested, but weapons and armour must be used to learn their secrets. Either way, a mistake may be costly. One guild charges 9000 coppers to remove a curse.

You start in the city square. The city is mapped on a 64 x 64 grid and a rudimentary map is provided in the instructions. However difficult you find the mapping, it must be done. Only then will you be able to locate areas that hide interesting locations.

On the city square are a smithy, tavern, inn, bank and two shops. Resting at an inn will restore lost hit points, and is also necessary when you become weary. Taverns sell food and drink. A 24 hour clock is used and any inn will tell you the time.



Hunt around for a cheap tavern in Alternative Reality

Both the inn and tavern on the city square charge top prices, so it is worth looking for cheaper alternatives. Menus at taverns change every hour. Return later if particular items are not available. Inns offer several types of accommodation. The more expensive will enable hit points to be recovered more quickly.

Sleep for 12 hours and you are almost certain to wake up hungry and thirsty. Food packets, pemmican and water flasks should be bought if possible. You can then eat and drink anywhere and are no longer tied to making special journeys to refresh yourself.

The cheapest inn seems to be the Warrior's Retreat on the east of the ►

arena in the north west quadrant up North Main Street. The cheapest bed is seven coppers; in the city square you pay 60.

Best value for food and drink is the Last Stop Tavern in the north east quadrant. Again go up North Main Street, but turn east half way up, then keep to the left hand wall and you will eventually get there. Once you have a compass – sold in all shops – you can find a more direct route for yourself.

The screen display is very clear, with your stats at the top and a scrolling graphic picture of your location below. Compass arrows accessed by the mouse make movement simple and positive. If surprised from behind, you automatically turn to face danger, and in twisty alleys it is easy to become disorientated and get lost.

Beneath the graphic display are shown encounter menus and inventory data. You do not have to be superfast to choose an option while fighting, and the game may be paused or saved to disc at any time.

Make back-up copies of your character disc at regular intervals. Diseases may take days to become apparent. If you die of disease on one disc you know you can visit a healer with the other. If you begin with a character having excellent stats, save and take time out to make a couple of back-ups.

At first, simply staying alive is no easy task. What money you get is soon spent at inns and taverns. Although the manual hints at caches of treasure, potions and magic weapons, I found them to be very few and far between. Having gained many thousands of experience points, I was still living from hand to mouth with a dagger my only weapon.

Initially try to go out only in daylight but once you have gained a few levels, a few trips at night can pay off. Ghosts carry all sorts of interesting things, and if you have a high charm stat they may be charmed. If they do not succumb at the first attempt retreat quickly. Early on, stay clear of wolves, rats, imps, gremlins, mold and slime as the risk of disease or poison is too great.

Alternate Reality is intended to be expanded, The City is the first adventure and The Dungeon the second. Characters from the City may be used in future games. Several locations – palace, arena, dungeon and wilderness are intended to be access points for future additions.

Sadly, I understand that not all these scenarios will see the light of day. Fortunately two more are planned for the Amiga, so all that hard work will be worth the effort. The game is totally addictive and the urge to have yet one more night foray to try and charm a ghost is almost excruciating.

REPORT CARD

Alternate Reality
Grandslam Entertainments 01-439 0666
Price to be advised by Grandslam

STORY LINE
Dream of all sword bearing adventurers.

AURA
Graphics and sound set the scene well.

STAYING POWER
Mapping and surviving a real challenge.

GAMEPLAY
Limited puzzles and no specific quests.

VALUE
Hundreds of hours at the keyboard.

DIFFICULTY
Survival and good progress is not easy.

OVERALL 80%
Good but lacks puzzles of any depth.



The adventure goes on in Time and Magik

LEVEL Nine has an enviable reputation for adventure games. Early examples were text only, but with the passing of time they have made a smooth transition to additional graphics. One early adventure was The Lords of Time, later came Red Moon and The Price of Magik.

Level Nine, now teamed up with Mandarin Software, has re-released these three titles as Time and Magik. All have the improved graphics, parser and operating system found in their recent games.

Lords of Time is a hunt though nine time periods, from before the dawn of man to the far future. Nine artifacts must be found and placed in the Cauldron of Time to defeat the purposes of the evil timelords. There are puzzles galore and the plot is both ingenious and spiced with its own special brand of humour. A must for any true adventurer.

Red Moon is all about magik. In the past the moon was crimson and the source of all great magiks. When the moon faded to the grey we know today, magik waned. To counter this loss, a host of magicians created the Red Moon Crystal. From the Moon Tower of Baskalos it shone out over the land, maintaining an island of magik. Then the great crystal was stolen.

You play a magician who must recover this fabulous gem and restore hope to the world. Unpleasant creatures are waiting for you, and

fighting with bare hands is not the answer. Weapons and armour must be found at the earliest opportunity.

Magik is vital to success. To use spells, enter a command of the type CAST ZAP. Spells are only successful if you have the object that is the focus for that particular spell. CAST ZAP requires a jewelled dagger and you cannot cast a spell if you have iron on or near you.

The Price of Magik is a sequel to Red Moon. Nearly all the action takes place in the House of the Red Moon where you must find and defeat the evil sorcerer Myglar. There are no treasures to find and no score is given. Score is recognised, but the response is only your present sanity level and apparent age.

You must learn, and find a use for, the spells that enable you to neutralise Myglar's powers. Casting spells follows the principles found in Red Moon. A weapon and armour could prove useful, but killing creatures you meet may release their ghosts, which bodes ill for future encounters. Some creatures may be controlled using magik.

Comprehensive clue sheets are available and they do not encourage cheating. Clues point you in the right direction but do not give definitive answers.

All three adventures are classics and provide a good challenge, full of humour and clever puzzles.

REPORT CARD

Time and Magik
Mandarin Software 0625 878888
£24.95

STORY LINE
Good text supports and links puzzles.

AURA
Creates believable alternative logic.

STAYING POWER
Plenty of devious puzzles to solve.

GAMEPLAY
Well thought out chain of reasoning.

VALUE
Three adventures! Worth every penny.

DIFFICULTY
Not easy but perseverance pays.

OVERALL 86%

Three classic games for everyone.



Piratical seafaring in Mindshadow

FOLLOWING last month's suggestion for cheap software, this month's offering at only £12 (from the right mail order house) is Mindshadow by Activision.

You have been betrayed and left to die on a desert island. To complicate matters you are suffering from amnesia. Not only must you escape but also piece together the clues to your identity. The action then moves to a piratical ship, to England and finally to Luxembourg.

The function keys are used to provide 10 commands: Save and Load game position, repeat last command, help, drop, get all, look at the, talk to the, quicksave and quickload. The last two, save/load the game position to/from ram and are useful if you are about to attempt anything risky.

Graphics are colourful and clear. Commonly used commands and a compass are shown in a window to the right and are actioned by clicking the mouse on them. The arrow keys control movement, and commands may also be entered via the keyboard in the normal fashion.

Most commands are given in a simple verb/noun format, but the parser recognises a limited range of more complex inputs when the need is called for. Help comes from the Condor, a somewhat enigmatic bird which will only help you three times but can come in pretty useful.

There are no red herrings, everything you find has a use but not all useful objects are described in the text, so look at the pictures carefully.

Locations are divided into sections, you are not able to move on to the next section until you have solved the current one. This does not mean that items found early will not be needed later.

First you must solve all the puzzles in the four sections of the game. Then you must think of six facts you have discovered to trigger off memories of who you are.

Mindshadow is not too difficult and is to be recommended for the newcomer. The clues are there – you have to find them.

REPORT CARD

Mindshadow
Activison 01-431-1101
£12 to £24 depending on store

STORY LINE
Reasonable puzzles mask lack of depth.

AURA
Amnesiac atmosphere almost believable.

STAYING POWER
Good training within small adventure.

GAMEPLAY
Basic solutions well presented.

VALUE
At £12 good value for the novice.

DIFFICULTY
Simply examine and use everything.

OVERALL 73%

Good fun and light entertainment.

Word processor par excellence

MANY powerful computers costing thousands of pounds sit in offices being used as glorified typewriters. Word processing is the number one computer application, which explains why so many companies rush to produce a word processor when a computer starts to take off. But in the stampede to be first on the shelves many of the things which make the product genuinely useful are overlooked.

Excellence is a program which aims to be a real Amiga word processor. It is integrated with the way the Amiga works and has benefited by learning from the products which were rushed into the shops.

As you would expect from a program costing £200, Excellence is

Simon Rockman gets to grips with a package truly integrated with the Amiga way of life



well packaged. It comes ring bound with two discs in a little cardboard holder and a warning to the effect that unleashing the discs is a tacit agreement to your passing up your birthright. Or at least promising that you won't pirate the software.

Many business packages need installing so that they can make the best use of your system. Excellence is the first package I've come across which needs to have its manual installed. The pages come shrink wrapped with the section dividers held separately.

The software also needs to be installed, and here Excellence is well thought out. Your newly-assembled manual takes you through backing up floppy discs painlessly. The wealthy among us will appreciate the single icon click which automatically sets up the system.

Being both wealthy and awkward I was delighted to find instructions for installing the system on a drive which had a different name to the standard DH0:. Unfortunately these instructions required a file to be loaded into Excellence, and since I hadn't got the program running it meant taking a risk and hoping that I knew what I was doing.

Despite this, Excellence proved to be by far the easiest thing I've yet had to install on my hard drive.

Most word processors offer some degree of wysiwyg (what you see is what you get), but Excellence goes further than any I've seen on the Amiga, intruding into the ground of desktop publishing.

It will handle several columns across a page, automatic hyphenation and offers a page display mode. All these features are beyond normal word processing.

Most people think that IFF is a screen standard. It isn't – there is an IFF specification for sound and for text. Excellence is the first program I've come across which adheres to the IFF text protocols. Not even Amiga notepad does this.

Good Amiga programmers know the guidelines and keep to them. The people who coded Excellence keep to the rules like a vicar on probation. This allows for all the fancy fonts which can be displayed and printed using the package.

It also means that graphics – IFF naturally – can be loaded into a document. Take your favourite screen, load it into DPaint, and then save it as a brush. This brush can then be mixed into an Excellence document.

Not everyone wants IFF text – comms programs, assemblers and compilers need an Ascii file. Excellence has an Ascii option tucked away on the save requestor.

Excellence supports up to 120 Amiga fonts, so you could use the Zuma fonts within your document. The results are not that impressive, but for the DTP addict there is a PostScript option which will produce wonderful, clear output.

As a word processor it is fully featured. Neat touches include a mouse pointer which disappears while you are typing and shows its face when you jog the mouse. An unusual omission is an overtype mode. This makes figure work difficult, even if you do use the special replace function. Otherwise the text editor is all you would expect.

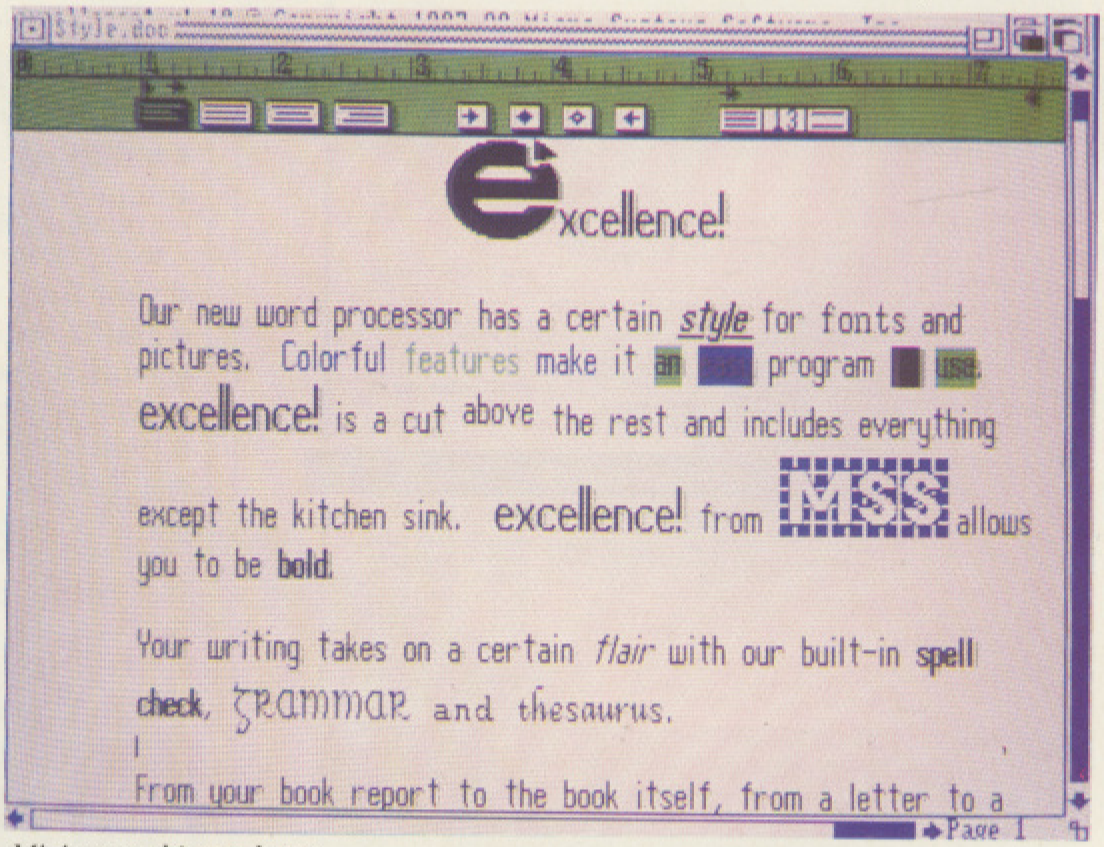
There are powerful macro facilities which cut down the number of keypresses you need for frequently performed functions. Text can be cut and pasted, and jumping from place to place in the text is quick and easy.

Layouts are ruler based, with a default ruler which affects the whole document, while extra rulers only influence the current paragraph. There are good ruler manipulation routines, so creating the desired effect is easy, once you have found your way around the menus.

For a program which puts so much emphasis on presentation, it is surprising that some of the hidden features are so well implemented. The spell checker, thesaurus and grammar checker are not just gimmicks thrown in so that they can be added to the feature list. They are the best I've seen on the Amiga.

The dictionary has a wide vocabulary, even if it is an American one. The spelling checker can be used to scan whole documents, or to check while you type. I felt that the list of alternative words was a little limited, but the whole thing is extremely fast. The spelling checker has a 90,000 word vocabulary, and with the exception of names it seems to be pretty comprehensive.

The thesaurus of synonyms and antonyms is not quite up to the standard of my well-thumbed Penguin paperback, but it is the best I've seen for the Amiga. It is much ▶



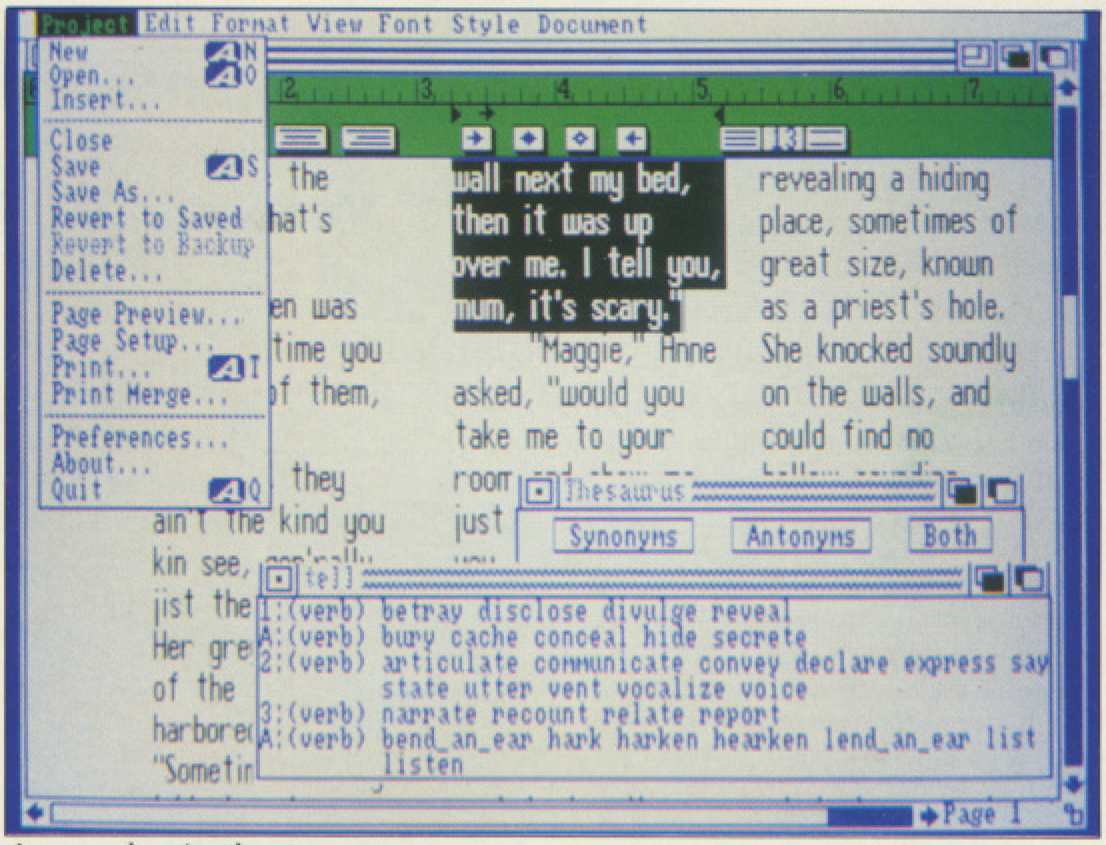
Mixing graphics and text

easier to summon a menu than go to the bookshelf.

It is not possible to follow a root from a head word without replacing the text and re-checking. This is something you need to do, because the list the computer chooses is fairly small. The speed of the search means that this is not too laborious.

The feature I liked best was the grammar checker. Excellence casts a stoney sub-editor's eye over your text and appraises it for readability. It is hard to believe that its conclusions are computer generated.

The software has a real understanding of English, picking up passive statements, pretentious phrases and cliches. It contains a lexicon of trademarks, suggesting that Kleenex be exchanged for tissue.



A comprehensive thesaurus

Over-used words are spotted and alternatives suggested. A friendly line of advice corrects you on meanings – suggesting farther in preference to further when you are talking about distance. This section of the program can really hurt a writer's pride.

Perhaps the greatest failing of Excellence is that the whole thing is one task. While you are doing one thing, other parts of Excellence cannot be crunching your text. I'd very much like to be able to grammar check one document, sending the output to the ▶



printer, while I worked on another.

Perhaps a more common requirement is to be able to print and edit simultaneously. Even using a laser printer there is a noticeable delay, and when sending bit-mapped images to produce the fancy fonts, printing takes an age.

If each section, such as spell checking, printing or editing was divided up into a separate task you could run as many as you had room for. It is possible to open up more than one text window, but you can only work on one at a time. This has the advantage that idle documents do not slow you down, as they do under WordPerfect, but I would rather have functions than speed.

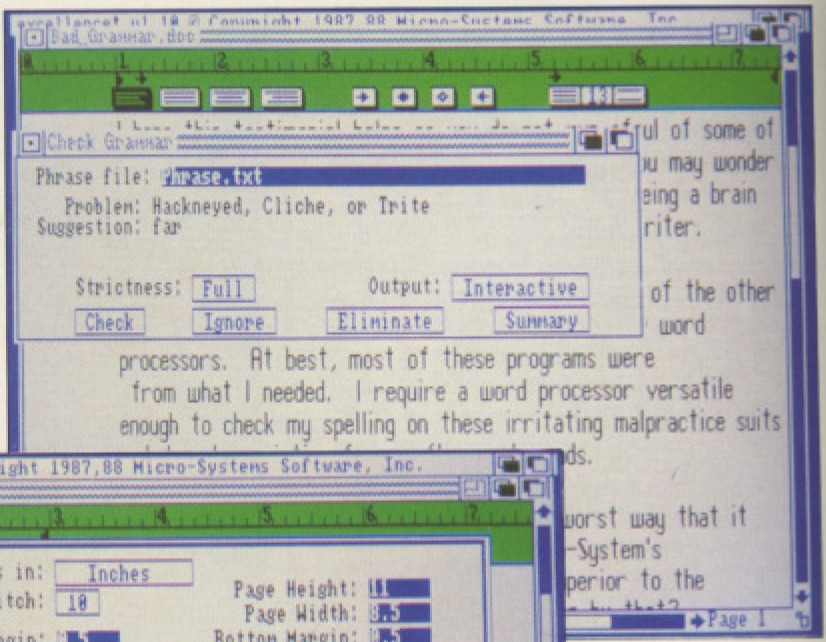
There is a way around this problem: If you have bags of ram you can run Excellence more than once, print from one copy and edit under the other. Since each of these tasks is going to want about 512k you won't get many 500 owners doing this.

The documentation is good, if a shade po-faced. Whoever wrote it is clearly very impressed by the goodies the program has to offer and wants to make sure you know how lucky you are to have such a wonderful word processor. The one thing I cannot forgive it for is the constant spelling of the program's name as *excellence!* – the grammar checker is not the only thing which is driven mad by a name, often used to begin a sentence, which starts with a lower case letter – or with an exclamation mark in mid-sentence.

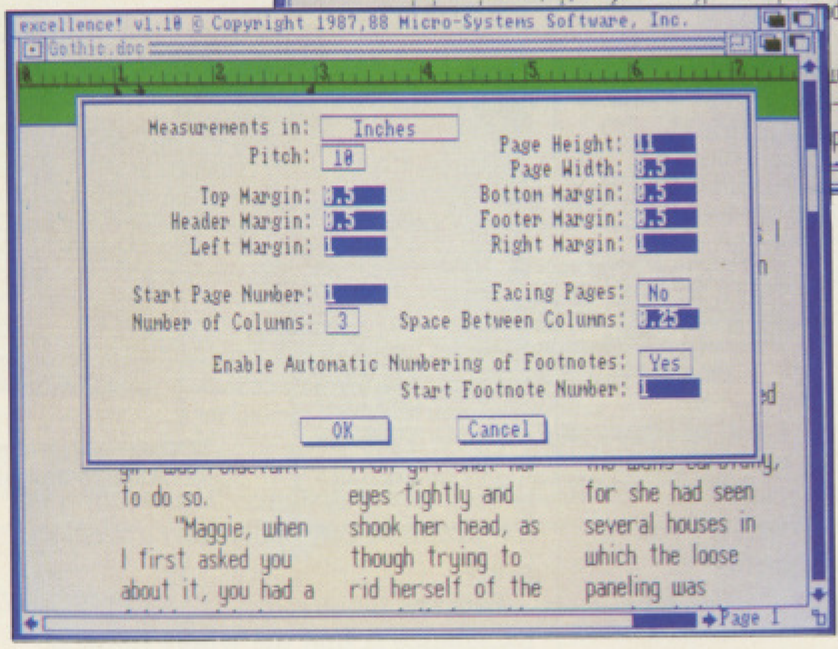
I have to admit to being a confirmed WordPerfect fan. When I saw the specification and a demonstration of Excellence I thought that this was the one for me – time to switch loyalties. But as I started to use Excellence I decided to stick with WordPerfect.

While researching this article I have overcome the problems of learning the new commands, and now think I would use Excellence if it were not for one minor problem: You cannot search and replace hard carriage returns. For most people, producing letters, reports and CVs this doesn't matter too much. But for a magazine editor who has to take articles from a variety of word processors and edit text which has a hard return on every line after a journey down the wires of MicroLink it is an essential feature.

I'd recommend Excellence to anyone who uses Scribble and feels limited. The spell checker, thesaurus of words and especially the grammar checker are wonderful tools. It is a great Amiga word processor and a properly Amigaised program.



The grammar checker pulls no punches



Full print options

REPORT CARD

Product Excellence!
Supplier MSS/Brown Wagh/HB Marketing 0895 444433
Price £199

USEFULNESS ....
Bridging the word processor/desktop publishing gap, Excellence covers a wide number of applications.

EASE OF USE........
Simple, window controlled operations reduce the number of commands you need to learn to master the program.

INTUITION...........
The program is well integrated into the Amiga way of thinking but would benefit from separating tasks.

SPEED...................
Excellence is very fast, even with large texts. The spell and grammar checkers are noteable in this respect.

VALUE ....
Excellence is expensive, not for what it does but in relation to the cost of the Amiga 500 and a suitable printer.

OVERALL *72%*
A solid program from people who know and love the Amiga

Amiga Online



Stuart Williams finds the phone line has him hooked when he's caught in the communications net

AN Amiga, equipped with a modem and terminal software, can be a means of speeding up mail electronically, a chance to make new friends, acquire free software, and have a lot of fun in the process.

Most people begin with commercial services. For Amigalings there are four main ones: MicroLink, Micronet, Compunet and CIX (pronounced "kicks").

MicroLink

THIS is the most businesslike of the services. It runs within the British Telecom Gold electronic mail system. MicroLink has its own Prime 9955 minicomputer, which is by far the most powerful machine offered by any of the similar services. While Prestel's computers have more raw power they do less for the user.

MicroLink is also the best connected. It has local call access to more places than Compunet or CIX and it is also connected to telex and the mail system. You can send a telemessage from your keyboard, which is transmitted electronically to the nearest PO delivery office to the addressee, where at is printed out for delivery by the postman. There are also gateways to overseas services and specialist items such as a translation desk.

MicroLink is a scrolling system, so you don't need any fancy software to log on, but then you do not have the

pretty graphics and colours of Prestel and Compunet.

Most people will join MicroLink for electronic mail. While you will meet people you will want to talk to on all the systems you are unlikely to find non-computer people with accounts on Compunet and CIX. And while you will find a large number of people on Prestel, the electronic mail facilities there are less powerful.

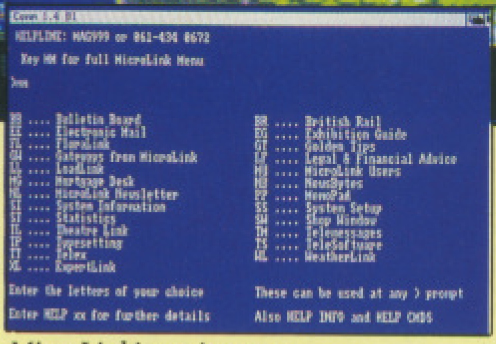
MicroLink offers unlimited mail storage, mail forwarding and sophisticated bulk mailing. You can send items express so that they are put on the top of the recipient's pile and even instruct the computer to inform you when your message has been read.

The bulletin board is the area where computer users chat to each other, and while the Amiga population is still quite small it is growing. Future plans include free software you can download into your Amiga.

It is worth noting that MicroLink also sells its own multi-speed modem. At £169 it is easily the best value around. With it comes a free account on MicroLink, but you can also use it with any of the other services described in this article.



WeatherLink is a service unique to MicroLink. You can now download pictures from a weather satellite directly onto your Amiga screen.



MicroLink's main menu

Micronet

THIS is the computing area on the Prestel viewdata database. Prestel is unusual in being a system dominated by non-computer users, with services ranging from train timetables to news. Micronet is the comparatively small computing section, but this still contains far more information that CIX or Compunet. Viewdata terminal software is required to use the text and block graphic system – Y2's Ruby View is popular.

Micronet has subsections on many popular micros, but until recently has had little specifically for Amiga owners. However, things are beginning to move in the right direction. The previously rarely updated Amiga section has been joined with the Atari ST area and reorganised to provide a better service. Experiments are being made into provision of telesoftware for downloading.

One excellent area which Amiga users patronise is Solely 64 & More, a Commodore area run by users. Reviews, hints and tips are available in a small Amiga area within this mainly C64/128 database. There's a lively letters section, updated weekly, in which Amiga letters feature regularly, asking for and giving help in friendly fashion.

Micronet's Bazaar is a section where you can advertise goods for sale, and Gallery an area where you can have your own group of up to 26 frames, at 99p a frame. Through the service you can make many friends and new contacts all over the country. Local Prestel access extends to 99 per cent of the UK mainland, so you are quite likely to find yourself holding conversations with people from Cornwall to Cumbria.

Prestel has limited electronic mail facilities. The Mailbox system can be used to send a frame to any other subscriber. Telex Link is adequate for brief telexes world-wide, but works out expensive if you have a lot of traffic.

Micronet has much to commend it on the entertainment side. Areas of general interest abound, particularly under the Clubspot heading. Hobbies such as music, photography, science fiction and astronomy are catered for, often run by the users themselves.

MUG fans can be found on Prestel. There is Micronet's own multi-user game, Shades, where you hunt for treasure and beat-up enemies in similar fashion to MUD. Like Compunet's multi-user games, there is a time charge for using Shades, in addition to the normal connect time charge.

Most Amiga owners who join Prestel will do so for the Micronet section, but there is also general non-computer information available.

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Compunet

MANY Amiga users who've upgraded from the Commodore 64 will have come across Compunet. Having 95 per cent UK local call access, the service was created for owners of that machine.

Compunet takes advantage of the C64's colours and graphics characters to produce a system akin to viewdata, with data sent and received in a paged format. Access to specific areas is through a system of menus, page numbers and keywords.

Because it uses Commodore 64 characters Compunet looks nothing like Prestel. Each frame requires more data but looks more attractive. There is a strong, and growing, Amiga presence on Compunet.

The terminal software, written by Ariadne, emulates a C64's graphics in a multi-windowing, multi-tasking environment. You can edit mail while downloading software, or moving from directory to directory.

Compunet's menu system is more like moving through disc subdirectories than the page number menus of Prestel.

All data is error-checked, so once logged-on there is no corruption. This is a boon when downloading the large range of free telesoftware.

Compunet encourages subscribers to place information and software on "the net". In places Compunet has the feel of a bulletin board because there are many sections run by users.

It is possible to charge other users for downloading your material. In this way you could pay for your subscription – after Compunet has taken its cut.

Compunet has a sophisticated mailbox system. You can send messages to several subscribers at once, but not to everyone on the system, which eliminates junk mail. It does not have any external electronic mail system or telex facilities.

The page format and slow system speed mean that while Compunet is great for short messages it is tiresome to use for sending long documents.

Multi User Games (MUGs) are dreadfully addictive. For those who are hooked Compunet provides Federation II, a space trading game. The famous Multi User Dungeon, MUD will also be appearing later this year. Partyline enables you to chat with other users nationwide.

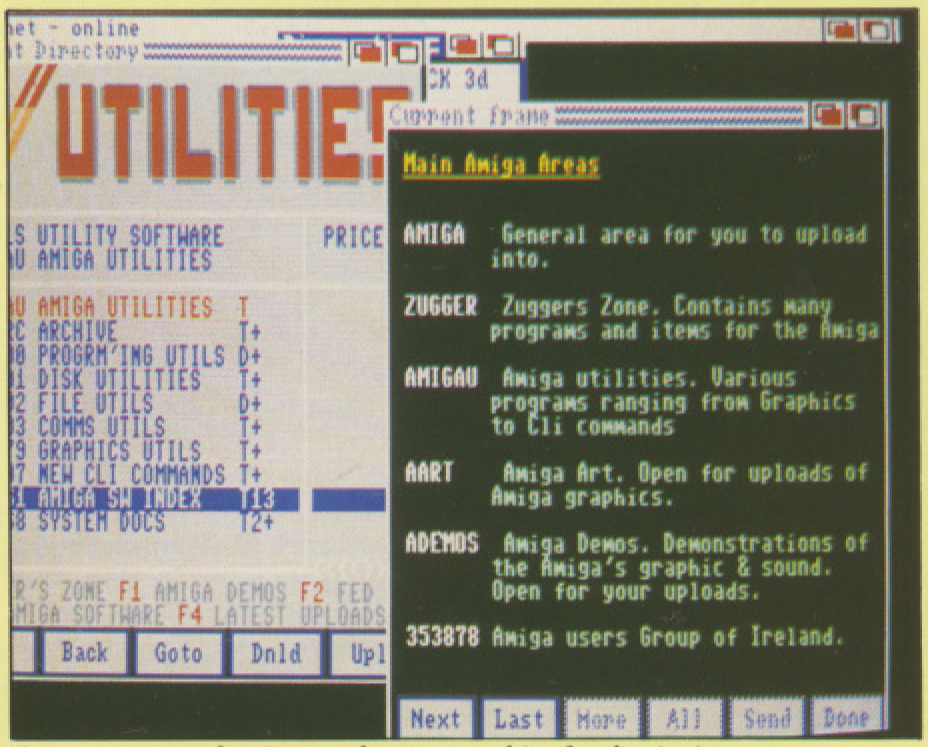
Both Federation II and Partyline cost extra – £1 an hour for Partyline, and £1.50 for Federation II.

Compunet has disadvantages and is rather more expensive than its main competitor, Micronet.

The major problem with Compunet is that it is very slow. Commodore 64 type frames contain both colour and text information per character square while Prestel is limited to colour or text. This makes Compunet seem slower.

The bulletin board nature of the system means that you often want to send a lot of data but at present the system only runs at 1200/75 and is slowed by the error checking.

The end result is that the Amiga seems to be working very hard for little result. A problem which will be eased when Compunet installs faster modems.



Compunet provides Commodore 64 graphics for the Amiga

Cix

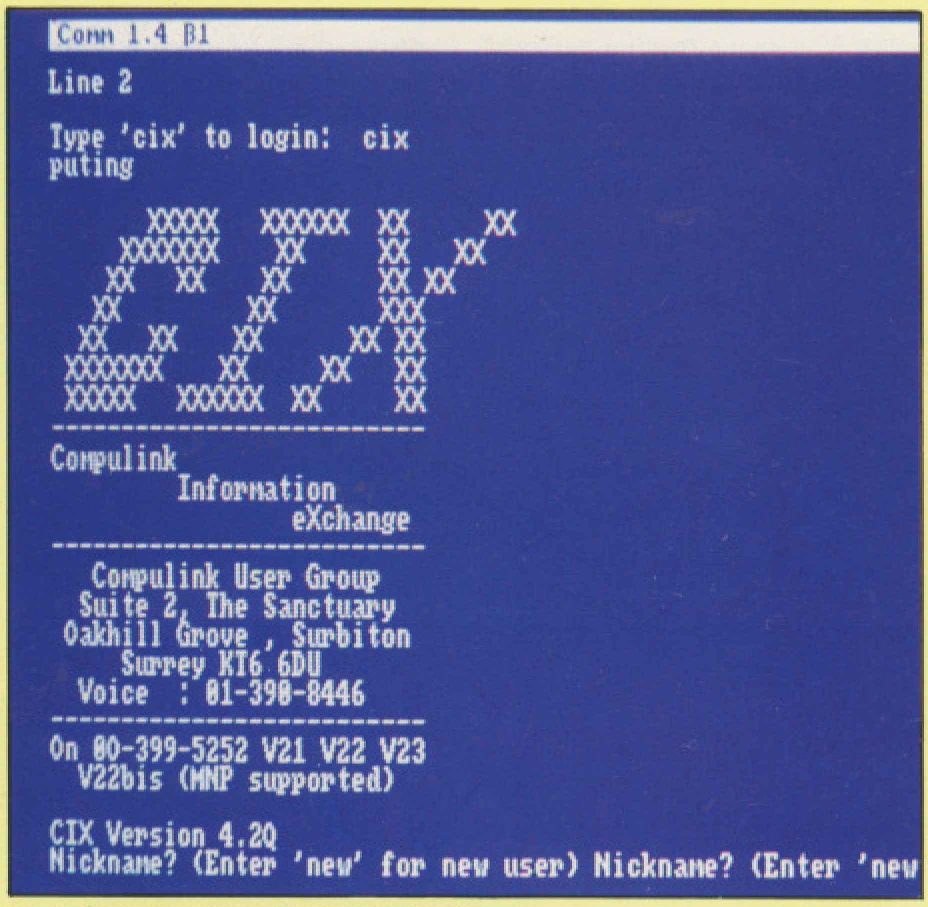
COMPULINK Information eXchange is very different. A much smaller system, it's not intended to be either a vast database of information or an opportunity to set up your own area within a larger system. In fact it is much closer to being like a sophisticated, multi-user bulletin board, with extensive conferencing facilities.

CIX is run by the Compulink User Group, a club whose main claim to fame is a mammoth library of public domain and shareware software, mainly for MSdos users, which can be purchased for £3.45 a disc. CIX is a UK version of BIX (the Byte Information Exchange) run by the American Byte magazine. Based on a multi-user Unix system CIX users can chat to each other while online, as well as participating in the many 'conferences' on the system.

Conferences are similar to the message areas or special interest groups on a bulletin board. Lengthy discussions take place in the form of linked messages, replies and comments. A vast range of subjects is covered, computer and general, including Amiga software and hardware.

If you want the latest gossip on what's going on in the world of the Amiga, then, short of logging on to the US systems, CIX is the place to be. All kinds of people, including software developers, frequent the

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The Logon page is as pretty as CIX gets

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system, and a vast amount of technical knowledge is available.

CIX has a limited amount of telesoftware, but it is primarily designed for debate. There's always something interesting to read and comment on. An excellent internal mail system allows lengthy messages to be prepared offline with your word processor and then sent when on line to any other subscriber. But like Compunet, it has no external mail service.

CIX does not use a graphics and text page system. Instead, it uses the scrolling text format familiar to users of bulletin boards and electronic mail services.

While this does not look as pretty, it has the advantage that you can pick up a public domain terminal program such as Comm 1.34 very cheaply which will do all you need.

There are also commercial packages available which do the same job, with the addition that you can program some of them to automatically log on, download mail and log off again. If you need this facility, then it may be worth paying between £50 and £100 for a commercial terminal program.

CIX accepts speeds from 300 baud (V21) to 2400 baud (V22bis) full duplex, with MNP error correction – no rubbish on screen with a bad line, if you have an expensive MNP modem – and you can also use a cheap 1200/75 (V23) modem. For this you will need special split baud rate software which is peculiar to UK written terminal programs.

If you have a Hayes-compatible modem, you'll have no problems, as these normally include speed buffering as standard. A speed buffered modem, such as the MicroLink multispeed or Pace Linnet, communicates with the computer at 1200/1200 baud even though the host computer uses 1200/75 baud. This compromise allows the modem to work with UK systems and the Amiga.

CIX has Mercury X.25 Data Line access from most parts of the UK. Calling the local Mercury exchange is so much cheaper for users outside London that savings on the phone bill outweigh Mercury's fee.

For further details on subscriptions and charges contact:

MicroLink	*0625 878888*
Micronet	*01-837 7872*
Cix	*01-390 8446*
Compunet	*01-997 2591*

MICROLINK

FOR: Local call access, huge user base. Reasonably fast modems, well connected with other services. Advanced electronic mail and telex.

AGAINST: Currently has a small Amiga user base, but this is likely to grow. Not cheap.

SUM UP: More wide ranging than just an Amiga database. For the comms enthusiast rather than the Amiga fan. Worth having in addition to one of the other services for electronic mail.

MICRONET

FOR: Good general computer news. Extensive magazine type coverage of computing topics. Many non-techie services such as home banking and shopping. Cheap off peak access.

AGAINST: Limited uploading, needs expensive communications software and not very Amiga oriented. High speed modems only work from some areas.

SUM UP: The most professional news service but lacks the clubby feel.

COMPUNET

FOR: Large number of Amiga owners. Plenty of high quality telesoftware to download. Lively debates. Moderate costs. Cheap terminal software.

AGAINST: Soporific line speeds. Uploading is tedious, speed not helped by the large amount of data needed for each screen.

SUM UP: The home of the average Amiga enthusiast.

CIX

FOR: Comprehensive conferencing. Suitable for high speed modems. Good quality of subscribers.

AGAINST: No local access outside London. Limited news, most information comes from subscribers.

SUM UP: Ideal for the more technically advanced Amiga owner who wants to chew the fat over pinouts and hard disc controllers.



Sounds sensational

Christopher Humphries takes a second delve into the world of Amiga sound

I INTEND this month to take a more in depth look at both the hardware and software that the Amiga uses to make sound. I realise at this point some of you might be saying "uh oh – he's going to talk about programming", and stop reading right there. Well, please be reassured. I may just mention a TINY bit about the programming side of sound, but I promise that otherwise I'll keep this as reader-friendly as possible.

I had to learn about how to make sounds on the Amiga the hard way – writing raw 68000 machine code based almost entirely on the information found in Amiga hardware reference manuals. Not immediately daunted by this (little did I know) I forged ahead with my efforts, my ultimate aim being good, fun sound effects for a computer game.

I began to realise that the sound hardware as documented in the manuals wasn't quite as straightforward as I had been given to believe. I suddenly had to deal with all kinds of unfamiliar phrases . . ."sampling period", "audio interrupt" and "sound DMA channel", to name but few. In fact, if it wasn't for the patient help of the people I was working with I think I might have given up there and then.

To my pleasant surprise I ended up with what I had set out to achieve.

Not all the things I had done ended up being done the way they should have been done originally, but this is often the case in computer programming.

What I really wished was that someone more knowledgeable than I had read all the difficult hardware manuals, realised what on earth they were trying to say, and said to me: "Well, Chris. This is what the author meant when he (or she) said such and such".

What I hope to do here is just that: Take what might seem to be the most inaccessible aspects of Amiga sound and make them fun and interesting to read about.

ONE question people always ask having looked at machine code instructions is: "These instructions are all very well, but how on earth am I supposed to use them to make graphics, or sound, or anything for that matter?"

The answer is usually to be found by looking at the special chips designed to deal with graphics, sound and mundane features, such as controlling disc drives.

These chips you will find usually all have one thing in common – they all use the memory of the computer to get data to tell them what to do. The special chips read their instructions and data from the computer's own memory.

This is the same memory that the main processor is so adept at manipulating, and it is possible to see that a computer with a powerful processor surrounded with many special – "custom" designed in the case of the Amiga – support chips, adds up to one very powerful machine.

Amiga sound is a very good example of the interaction of a microprocessor and a specialised custom chip in a computer.

The Amiga makes sound by using

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◄ its special sound hardware chips to "play" a sound waveform that is held in the computer's memory. This sound waveform, the sound sample, is merely a series of numbers to the 68000 processor, just byte after byte of data.

However, to the Amiga sound hardware, this data is used to modulate the movements of the speaker in your monitor. To prove that the data itself was nothing special to any other chip, try giving it to the graphics chips. They would try and use the data for the colours and positions of pixels on the computer screen.

Worse still, if you gave the data to a very special chip like the Copper graphics co-processor, you would probably end up with a total graphical mess on the screen as the Copper tried to execute the data as graphics instructions.

So each chip must be handled properly by the programmer, using the instructions of the 68000 as a tool. The Amiga sound chips need data in the form of a sound waveform, but this is not enough for it to play the sound properly. For example, how long is the sample being played? Which of the four channels is being used to play the sound? What playback rate should it be played at? A good question here would be: "How do I, the programmer, tell the sound hardware what to do?"

THE answer is at our fingertips in the form of a register. To understand what a register is, it is easiest to think of the computer's memory. A register is like an address in memory. Using the instructions of the 68000, values can be written to and read from the registers, just like a byte in memory when you peek or poke it in Basic.

The 68000 has 16 registers in all, each a massive 32 bits (4 bytes) in size. The value of having registers as well as memory to work with is that registers, being physically on the 68000 itself, are much faster to use for manipulating data.

All custom chips on the Amiga have registers too. So that the 68000, and therefore the programmer, can access them, these registers are given addresses in the computer's own memory. You needn't worry about losing your own 512k (or more) ram to these registers, as they use addresses not used by ram. You can think of them as a special kind of ram used by a certain custom chip to communicate with the rest of the computer.

The information needed by the sound hardware to play a sound sample can be passed by the 68000 to the sound registers which sit at a specific point in the Amiga's memory.

THERE are four sound channels. Each has to know things like: "Am I on or off?","If I am on, where is my data?","How long is my data?","At what pitch should I play my data?" and "What volume should I use to play my data?" For each of these requirements – and more – registers exist by which route the programmer can pass on instructions to the hardware as if he or she was writing to the computer memory.

Perhaps the only real problem yet remaining for the computer is a way for the sound hardware to get at the data in the first place.

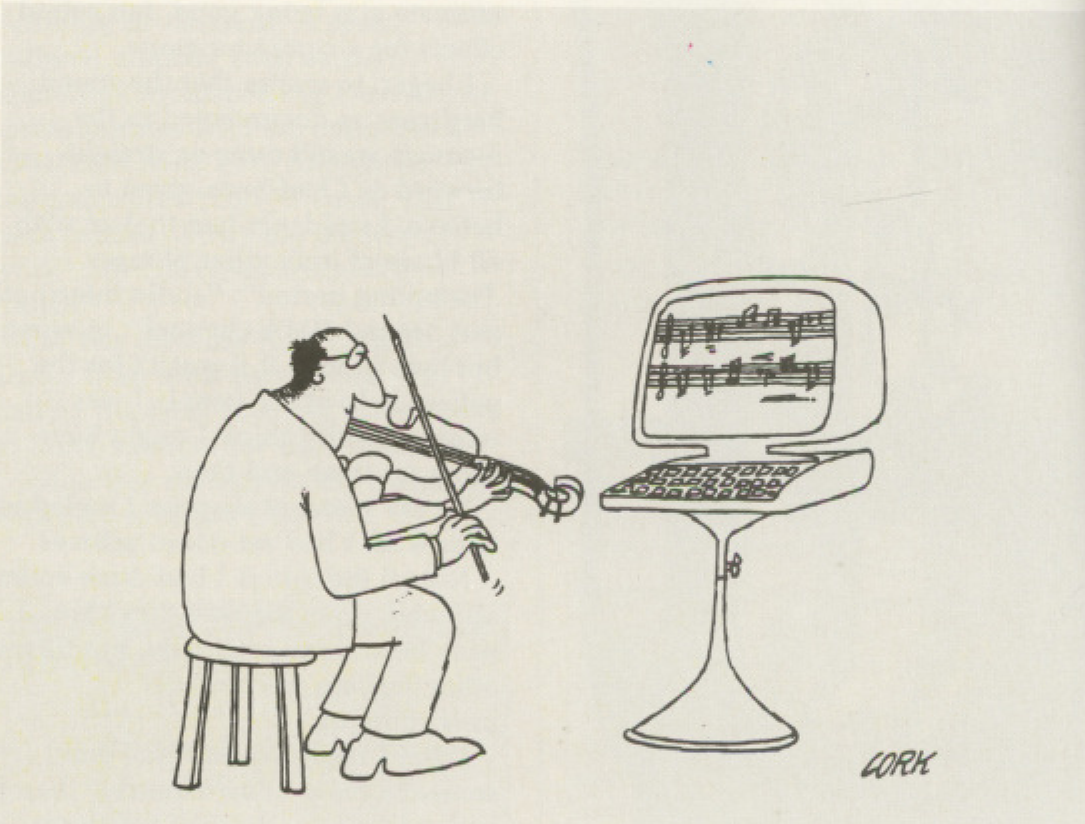
This might sound silly, but is a serious problem to be solved, since it is the microprocessor that accesses memory, and nothing can access that memory at the same time. However, a solution to this problem of memory access comes in the form of DMA – Direct Memory Access.

DMA is a hardware feature used extensively in Amiga custom hardware. Many of the Amiga custom chips take the burden off the 68000 by performing tasks that the 68000 would otherwise end up having to do. The Amiga has 14 DMA channels that the custom chips use, and I quote "....to read or write memory directly without having to interrupt the processor".

Essentially, DMA makes use of the fact that although the 68000 itself has the main link with the Amiga's memory, this link is not constant and occurs in cycles. The DMA works by allowing the custom chips to access the computer memory in between the cycles that the 68000 uses, and providing you are not using too many custom registers, this memory access doesn't slow the functions of the computer at all.

However, be warned, custom chips used simultaneously will fight for the DMA channels when they are in short supply, and unfortunately for some, these with the highest priority win the battle.

Don't worry too much though. Sound has a fairly high priority too, both to the Amiga and to us.



Alternative Basic

A compiler can speed up your programs, but you will have to master a new Basic. Rupert Goodwins sees if using one is really worth all the effort . . . and the lucre

THE Microsoft Amiga Basic is many things. It's quite slow and it's cramped – on a computer with half a megabyte of memory there's usually just over 20k for a Basic program. And it's free with every Amiga. Anybody who tries to sell a Basic in direct competition has to produce something that wallops Microsoft hard enough on speed and space to overcome the undoubted advantage of the latter costing nothing.

Delphi Noetic is an American (surprise) company that is trying just this. Its Basic, called F-Basic, makes a number of claims for speed and size, and also offers some extra functions over Microsoft. It departs most radically from the standard by being compiled, as opposed to interpreted.

Compilers are noted for several reasons: Firstly, they produce programs that can run much faster than interpreters. Secondly, they make greater demands of the programmer, and are less safe, warm and cosy an environment.

Interpreters take a line of Basic, examine it, make sure there are no syntax errors, and run a series of machine code subprograms as a result. They then take the next line and do the same thing again, each and every time the program is run.

Compilers run through the Basic program, examine it line by line and translate it into machine code. They don't run this at the time, but store it away on disc or in memory as the executable code. The Basic program is called the source code, and is only needed once.

After compilation, the executable code can be run as a machine code program without having to be recompiled. As all the error checking and translation don't need to be done again, the executable code can run many times faster than interpreted source code.

Creating an F-Basic program happens in three stages. First, the source code is written. This is normally done with a text editor. The F-Basic system includes a copy of the standard ED editor but there are no instructions for use, so the AmigaDos handbook is needed. Provided your favourite editor – such as Word Perfect – can produce ordinary text files you can use that instead.

ONCE the source code exists, the compiler is run to produce the machine code program. At this point any syntax or other errors are reported and the source code edited until acceptable to the compiler.

Compilation is simple enough – just FB source-name from the CLI prompt – although various options to set memory usage or display lines of source as they are compiled can be specified. This can be useful, because when errors are reported, the exact place where they occur can be a little tricky to spot.

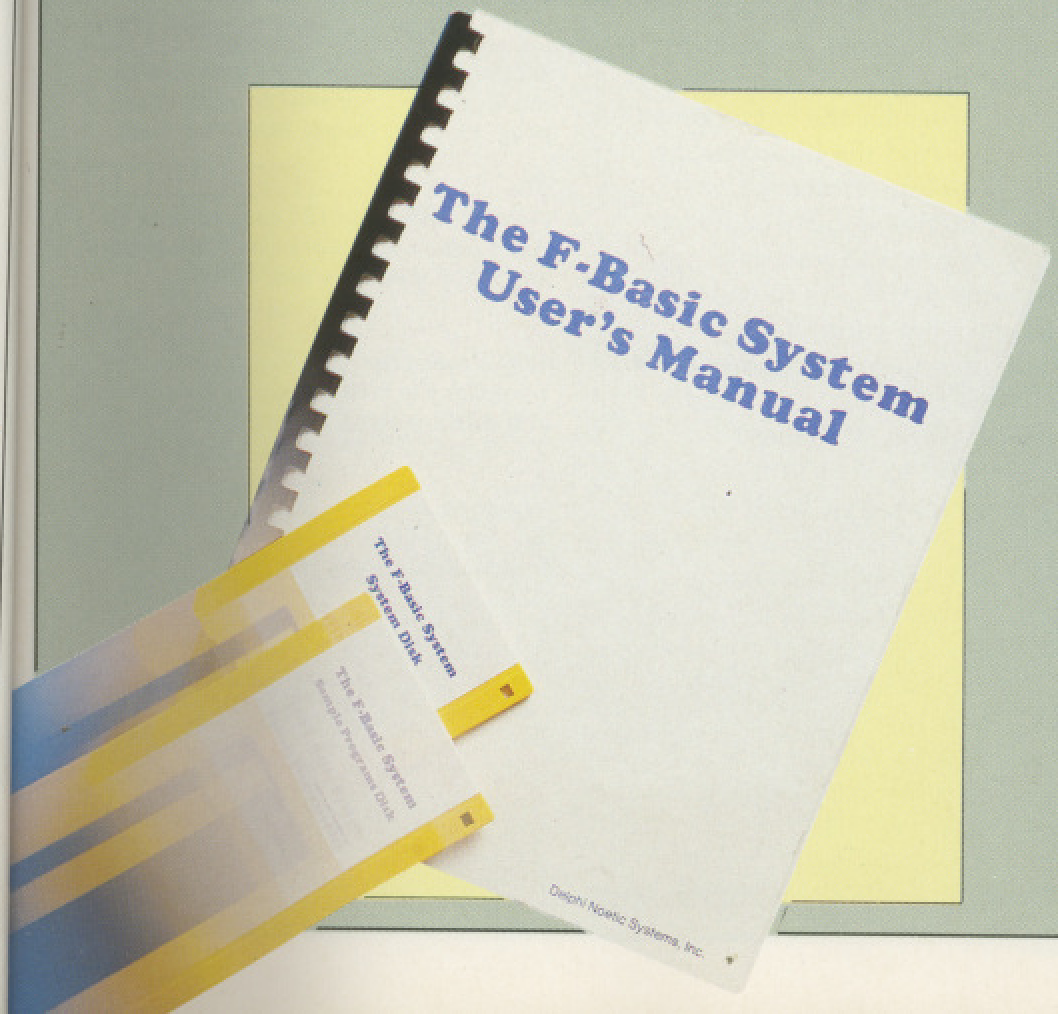
For example I missed a # because of an American keyboard map being in force, and got the following helpful message:

```
*** FastCom Error Diagnostic Report ****
X=WINDOW'20(0,0,640,200,0,0,0,0,-1,-
1,0,0,-1)In Module TestProgramOne,
Line#4Compiled,Has Produced This
Error:   [8] Undefined Array/
Subroutine/Function/Library
Reference: WINDOW '20 (0,0,640,
```

There is perhaps a little room for doubt here, even more when the same message appears for lines with not enough brackets – not unmatched, note, just not enough – or with an extra space between a function call and its parameters.

Diving into the manual produces precious little relief. The index offers no entry under Error, Diagnostic or Report. The only mention comes under C as Compile Time Errors, which directs the hapless reviewer to a paragraph which says that compile time errors are those which happen during compilation, and a list of "all possible" errors although I got others at times.

No explanations mind, just a list of ▶



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errors word for word identical to those that appear on screen and not a hint of explanation or reference to the appropriate bit of the manual. The rest of the manual is similarly reminiscent of the bad old days. It's spiral bound, with card covers and unevenly reproduced A4-ish typewritten pages. Quite similar to PDP-8 – a minicomputer of the 70s – handbooks. This isn't too bad, given that it is legible and quite well written and organised – apart from the occasional shocker like the error reports – but it all helps to give the package an air of hackery rampant.

F-Basic has other features which do nothing to dispel this impression: Commands must be typed in upper case. A space in the wrong place can cause acute discomfort to compiler and programmer. When using functions in a long chunk of arithmetic, such as 100+50*SIN(Y/80), brackets need to be liberally sprinkled about to help the compiler get priorities right. Programs must start with PROGRAM and end with END. Variables need to have their type specified.

However, line numbers are optional and labels preferred. There are WHEN switches – stolen from the C language's CASE; several other features have a similar ancestry, WHILE constructs, extensive pattern matching and, most importantly, as many Amiga special functions as Microsoft – windows, WAVEs, mice and all. Which is why you bought the Amiga in the first place.

So in some respects F-Basic is as advanced as any other Basic, interpreted or compiled. It's certainly got everything in the way of array, file and event handling – you can detect mouse clicks or key presses without waiting for them to happen – that a programmer's likely to need.

There are some features which aren't really advanced, more plain dynamite. And I mean this precisely; the ability to insert 68000 machine code at any point in a program might be useful to a fully-paid up underground hacker, but deadly to a novice.

Note that F-Basic makes no claims to be Microsoft Amiga Basic compatible. This isn't surprising, as the extra programming needed to successfully compile a program initially meant for interpretation would doubtless have lead to less compact and slower executable code. But it does mean that some editing will have to be done to make any existing Basic programs compile.

The two dialects are similar enough to allow the structure of existing programs to be maintained – and of course you do write nice, modular programs, don't you?

And it is fast. How fast depends on what it's doing. When it's using the Amiga rom routines to write graphics or text to a window it's going to run at much the same speed as ordinary Microsoft Basic. But when it's doing raw computation it can run at 30 or 40 times the speed of the competition.

Although the executable code files produced aren't too big – each program weighs in at about 700-800 bytes plus 25 or so bytes per line of source code – they do need to have the library file present to run. This is about 35k long and contains things like maths and i/o routines. In an interpreter such things are embedded deep within the syntax checking code but the whole idea of the compiler is to get rid of all that.

This has ramifications, because if you write a commercial program in F-Basic you'll need to give the library file away in order for the users to run your software. And the library is the copyright of Delphi. However, you are allowed to give it away provided you notify Delphi, and you only need pay a nominal $10 if you intend to make money from your efforts.

Another advantage of a compiler such as F-Basic is that it can handle far larger programs. Whereas interpreters tend to be written so that all their program has to be in memory at once – limiting the size, a compiler can throw away a line of source immediately after translating it to machine code.

So F-Basic is as happy with a 100k source file as it is with a 1k tiddler.

Ease of programming in F-Basic will depend on the experience of the individual. I've been dabbling with more different Basics than I care to count for about seven years, and found the switch to F-Basic easy if sometimes frustrating. But some experience of Basic is needed, because the documentation only covers command structure and syntax. It doesn't explain terms or attempt to teach programming – a reasonable attitude.

Although I didn't write any major programs in the language in the time I had it, I wouldn't hesitate before embarking on a large utility project using F-Basic. Indeed, the manual claims that the F-Basic compiler was written and compiled using F-Basic itself. It's certainly good enough to perform one of the traditional functions of Basic: A quick and dirty testbed for ideas, screen layouts and programs. And the result, unlike traditional Basic, should be fast enough to use as the final product.

If you're a competent Basic hacker, keen to grab a bit more speed and unwilling to spend a year or so getting comfortable in machine code or – heaven forbid – C, F-Basic is a pretty persuasive alternative.

REPORT CARD

F-Basic
Amiga Centre Scotland 031-557 4242
£70

USEFULNESS
Whatever you usually do with Amiga Basic can be improved by writing the program with Delphi Noetic's F-Basic.

EASE OF USE
F-Basic runs from CLI and requires an Ascii editor. The documentation is poor and error messages user hostile.

INTUITION
While the actual program is not wimpish the code produced is kosher and mutli-tasking friendly.

SPEED
The time taken to compile is reasonable but the speed of the resulting code is impressive, particularly for maths.

VALUE
For a language £70 is not much money. But with Amiga Basic supplied free you'd need to be a heavy user to buy it.

OVERALL *68%*

Only people who have used Amiga Basic for long enough to become frustrated will buy this.

COLOUR FOR A CHAMELEON

Francis Jago finds that a £1,300 printer is no little squirt

YOU will not get a better all-round computer for under £600 than the Amiga. Fabulous graphics, stereo sound, multi-tasking capabilities, and an expanding base of quality software. What it lacks is enough clout for hardware companies to start supporting it by producing dedicated peripherals – particularly printer companies.

In order to counter this problem, Commodore has given the Amiga chameleon qualities. It can adapt around the hardware provided, rather than vice-versa. With the latest version of preferences (V1.3), there is support for almost all popular printers, and plenty of pretty idiosyncratic ones – including the Xerox 4020 color (to use the manual's awful American spelling) ink jet.

The main reason that colour printers haven't become more than a passing flight of fancy is that the quality rarely justifies the expense. Machines like the Epson JX-80, although technically a competent printer (basically a FX-80 with a colour ribbon), are stretching the abilities of a 9-pin dot matrix far beyond normal realms. And this is reflected in the quality of the output – faint and unclear; really not much use.

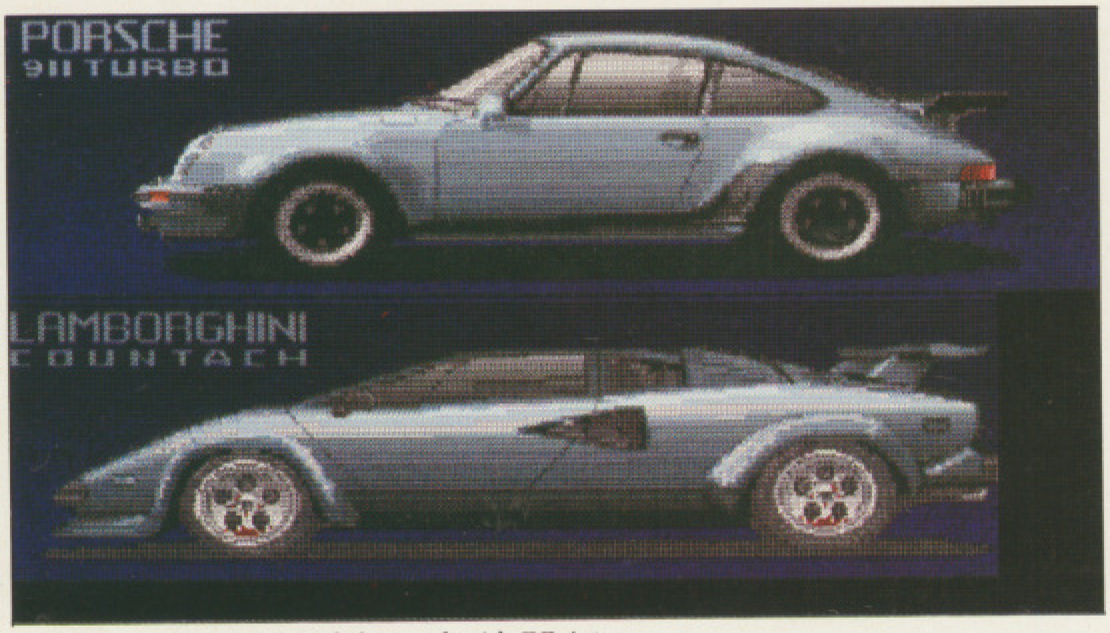


The Xerox handles colour with aplomb

If you believed half Apple's advertising, colour printers would not have a place in the world. But having spent many weekends trying to take screenshots, I firmly believe that a high quality colour printer is an essential peripheral for anyone wanting to make the most of the many excellent graphics packages available.

When I first heard that the colour printer on its way to me was an ink jet, a great deal of my excitement disappeared. I have had quite a few ▶





Stolen from Test Drive and dumped with DPaint

◄
ink jet printers to review, and without exception they were all messy, difficult to set up and produce print. The worst example was the Olivetti JP-101, designed to go hand-in-hand with the BBC Micro and yet so bad it became a legend.

The one redeeming feature of ink jets is that they are very quiet, but this hardly makes up for all the other problems.

Once the machine arrived, I spent the first 15 minutes setting it up. Moving this type of printer is a dodgy job. It arrived barricaded by protection bars and plates which had to be removed before I could begin to get the machine going.

I fed in the paper (of the slightly glossy type, provided on a roll), filled up all the pots with the correct type and colour ink, turned on and stood back.

Even having used this type of printer before had not prepared me for the noises the machine made while it powered up. Rattles, bangs, squeaks, gurgles, and more. After about 30 seconds, it went on line.

The next stage was to boot up Deluxe Paint II, load in a couple of my better files and see if the printer would work. In some ways it did, but it took a few hours playing with the dip switches to get it functioning at anything like 100 per cent.

Once it was working the Xerox was a joy to behold. Quiet, not too slow, and capable of producing by far the best quality screen dumps I have ever seen – including some professional colour dump houses.

In order to really test it I printed a series of solid blocks of colour and examined them to see how smooth and even the colour spread.

Amazingly, apart from a slight fading in the green bar, the black, yellow, pink, red, blue and purple bars were all smooth and, thanks in part to the quality of the paper, nearly of photographic quality.

The most surprising aspect of the 4020 is its text. Printers capable of high quality graphics usually suffer from poor text printing. Although by no means letter quality, the text is perfectly readable and better than many NLQ printers. The 4020 is not the fastest of machines, managing 80 characters a second in draft mode – using black ink only – and 40 cps in NLQ using four colours.

For anyone wanting to use it to produce documents there is a choice of five different fonts (typefaces) which, although slightly Americanised, are both attractive and usable for all but the most formal letters.

As with most ink jet printers, the bain of any 4020 owner's life will be maintenance.

Although the 4020 has its own internal self-test, and more importantly automatic printhead recovery (the returning of the jets on power down or because of a fault), the cleaning and care with which you must treat this machine is something all potential owners should consider.

There is one other major consideration when looking at the 4020; it costs £1,300. For owners of Amiga A500s this will seem like a great deal of money. For the wealthy among us who own A1000s and A2000s, it allows facts and figures in colour (text and graphics can be easily integrated on one page). More importantly the printer can easily cope with acetate slides, perfect for anyone wanting to produce colour overhead projections.

When you go on to consider the technicalities of the 4020 it becomes quite clear that £1300 is not actually that much. With a resolution of 120 dots per inch (240 dpi in NLQ), bi-directional and near silent printing, this Xerox is coming very close to the quality laser printers (Apple's top of the range Laserwriter II NT-X, which costs £4,500, has a print resolution of 300 dpi). Most importantly, however, you have colour.

If you are thinking of buying a printer for your home, or because you want to do a lot of text output, then the 4020 is not for you.

If, on the other hand, you need to produce graphs, charts, pictures, technical diagrams, or carry out any of the graphic functions that the Amiga does so well, then the 4020 is the perfect tool.

The Xerox is expensive, well made and an excellent performer. A bit like the computer we love.

REPORT CARD

Xerox 4020 colour printer
Pragma Ltd
£1,295

USEFULNESS
Fast, quiet, high quality colour screen dumps. Slow text speed helps quality.

EASE OF USE
Messy ink jets contained within a good design reduce, but fail to eliminate, the usual problems with squirty printers.

SOFTWARE
Select the printer and all Amiga programs should be able to use the 4020's features. Isn't the Amiga wonderful?

SPEED
Good for an inkjet but that doesn't say much. Not suitable for extended use with text. Buy a cheap dot matrix too.

VALUE
A printer which costs more than an A2000 with hard disc and monitor is really only for the wealthy.

OVERALL *64%*

An unspectacular score for what is a spectacular product. But it's hampered, as so often, by the price.

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Focus on Amiga animation

Has desktop video arrived? Simon Rockman finds out



THE Amiga is a computer with stunning capabilities and no one has yet stretched the machine. There are some things that no other home computer can do half as well, notably graphic animation.

Many a wise Amiga watcher has said that desktop video will do for the Amiga what desktop publishing did for the Macintosh. Before the Mac arrived no one would have dreamed of producing a professional newsletter from home. The odd letter typed out on a manual Silver-Reed, but not typeset. Now it is a cottage industry.

Up until now no one would have dreamed of making a professional video, with animation, titles and credits. The odd video of a wedding, barmitzvah or kiddies party, but not a promo to rival Godley and Creame.

Even if you don't want to produce commercial products, it is fun to mess about. Videoscape is the software which turns the Amiga from an interesting graphics tool into a full animation suite. You won't be able to produce the next Smarties advertisement but you could have a creditable attempt.

Designing shapes with Videoscape is complicated. A simple triangle has three points, each with two coordinates. A four sided pyramid has five points, each with three coordinates. The edges are what matter for sorting out the shading, and a triangle only has three. The pyramid has eight. All the vertices have to be defined, then colours specified for each enclosed triangle.

The flat shapes are called polygons. The program insists that each polygon

is flat – the x, y or z coordinate must remain common. But the shape can have up to 24 vertices. For simplicity it is best to make each polygon a triangle, since this ensures that the shape is flat.

Objects do not stay still. They can move in 3D space. Aviation terms have been borrowed to try and clarify the meaning of different movements. Pitch denotes a change in the y, bank in the x and heading in the z orientations. A movement script needs to be worked out and written with a firm grasp of what is going on.

Things get even more complicated when the viewer starts to move independently of the object. If your aeroplane is flying one way and you move another then keeping the shape in view is very difficult. Add to this the option to metamorphose shapes – ideal for the flapping wings of a bird for instance – and it all becomes very complicated.

The package comes with a fold-out strip of cardboard to remind you which direction is which. I initially scoffed at this and then had to excavate it from under a pile of discs in the middle of quite a simple exercise.

The manual suggests using graph paper, model-planes and a matchbox as a camera so that you can work out what is going on. This advice is second only to the recommendation that you don't let anyone catch you behaving in such a way. A simple compromise has been made in only allowing one light source and that is limited to one intensity. The lack of shadows is slightly unreal, but the lighting which is used makes the shapes look convincingly solid.

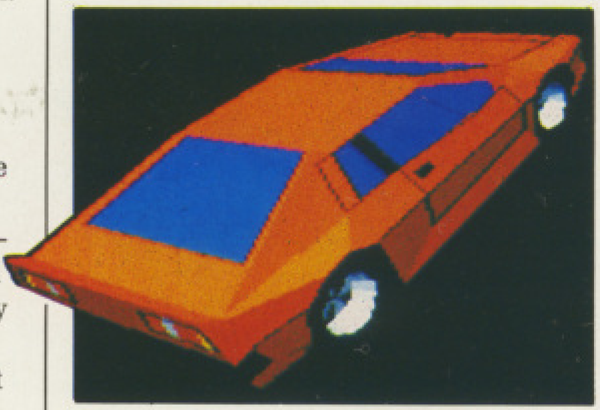
Often the problem is describing to yourself what you want to do, as much as it is about doing it.

All this work is carried out by defining points – typing in strings of numbers with all the visual appeal of a guru meditation message.

Debugging a shape is tiresome. You can see that something has gone wrong instantly, but finding it and putting it right is a laborious task.

ALL the shapes need to be defined with an Ascii text editor. I used both WordPerfect and ED, the standard Amiga editor. Despite the undoubted power of WordPerfect I found the need to hop between the editor and Videoscape meant that I preferred to use ED, WordPerfect taking too long to boot. With more ram I could fit both packages in at once and multi-task. Ram-hungry Videoscape will run on a minimum A500 configuration of a single drive and 512k, but a second drive makes it easier to add and store objects. Videoscape will make use of up to 4.5Mb, 1Mb being necessary if you want to run a full animation in ram.

EGG and OCT are two separate programs which cut down the effort required to generate a shape. EGG stands for Easy Graphic Generator. It is a library of simple shapes, like cones and spheres. These form building blocks for more complicated shapes. I'd have liked the ability to add more shapes, but as it stands EGG is a timesaver. Its name is misleading, but then Less Than Mind-Numbingly Difficult Graphic Generator (LTMNDGG) sounds more like a trade union than a software tool.



Designing shapes is complicated

OCT is the word for Object Construction Tool. It allows you to take a number of shapes and join them together. The use of EGG and your own mathematical edifices, combined by OCT, speeds up Videoscape, despite being a brain-twisting experience.

Videoscape is a messy program to use. I came to the conclusion that if I wanted to do anything useful with the program I'd have to spend a couple of days writing a shape editor first.

There are several programs, each with a different idea of what the user wants. They take a very long time to get to grips with and the price is way over the top. The bad program design is a result of the way in which the package was developed.

Allen Hastings put together some routines for his own use. He wrote and recorded on to video a couple of 30 second animations.

Being justifiably proud of his creations he took them to the local Amiga user group (FAUG – the First Amiga User Group in Palo Alto, California). The response was overwhelming and he was invited to the Amiga developers' conference in Monteray. There the demos met with spontaneous applause and a contract from Aegis.

Yes Videoscape is clever, but if it had been designed to be marketed from the outset the result would have been neater. This does not detract from what you can do with the package. A little rough around the edges, but at a price which means people can afford to buy a system.

Many universities and polytechnics teach computer graphics, but with a Quantel Paintbox costing £150 an hour and image recorders tens of thousands of pounds, practising is not affordable. The home user may find it difficult to justify this as anything more than an expensive video-titling system.

After all, if Channel 4's The Chart Show can make do with one set of animated headphones and the Amiga operating system windows then do you need to get much more sophisticated for home movies? Probably not, but The Chart Show under-uses the Amiga and there is a terrific buzz to be gained from producing a good animation. There is a lot of work involved. But then, Hollywood wasn't built in a day.

REPORT CARD

Videoscape 3D
HB Marketing 01-844 1202
£143.75

USEFULNESS ....
For most people this is little more than an interesting graphic diversion.

EASE OF USE ....
I doubt that they could have made this more difficult if they tried.

INTUITION ....
The program multitasks OK but does not use gadgets and drop down windows which it cries out for.

SPEED ....
Fast calculations despite code being complied C and not machine code.

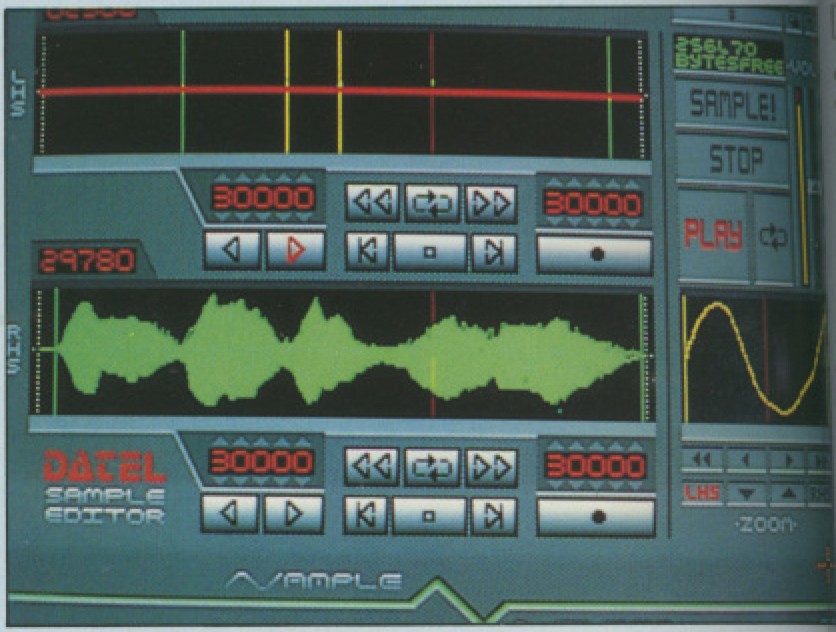
VALUE ....
Expensive for such a crude package.

OVERALL *49%*

Needs an editor and a radical price cut.

DATEL ELECTRONICS





AMIGA PRO SAMPLER STUDIO

- A top quality sound sampling system at a realistic price.
- All the usual features of a sampling system plus many more.
- 100% machine code software for realtime functions.
- Hires sample editing.
- Realtime frequency display.
- Realtime level meters.
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- Microphone and line input ¼" Jack and Din connections.
- 3D shot of sound waveform. Wave editor to design your own waveforms or adjust existing ones.

ONLY £69.99 COMPLETE SYSTEM, PLEASE STATE A500/1000/2000

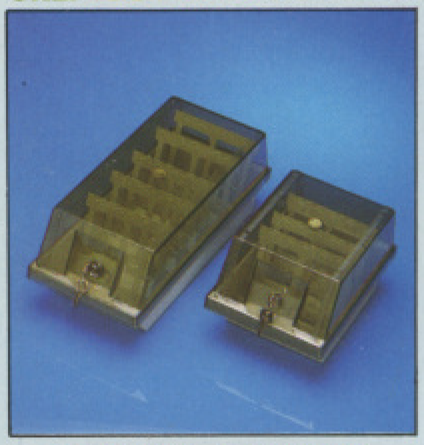
DATEL JAMMER

To complement the Sample Studio the Datel Jammer gives you a 5 octave keyboard to play and record your sampled sounds.

FEATURES:

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- 4 track sequencer up to 9999 events.
- Tempo and Beat Controls.
- Mixer Controls on Instruments.
- Load and Save sequence.
- Works on standard IFF file sounds.





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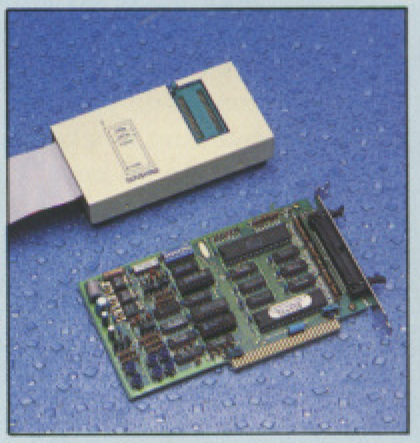
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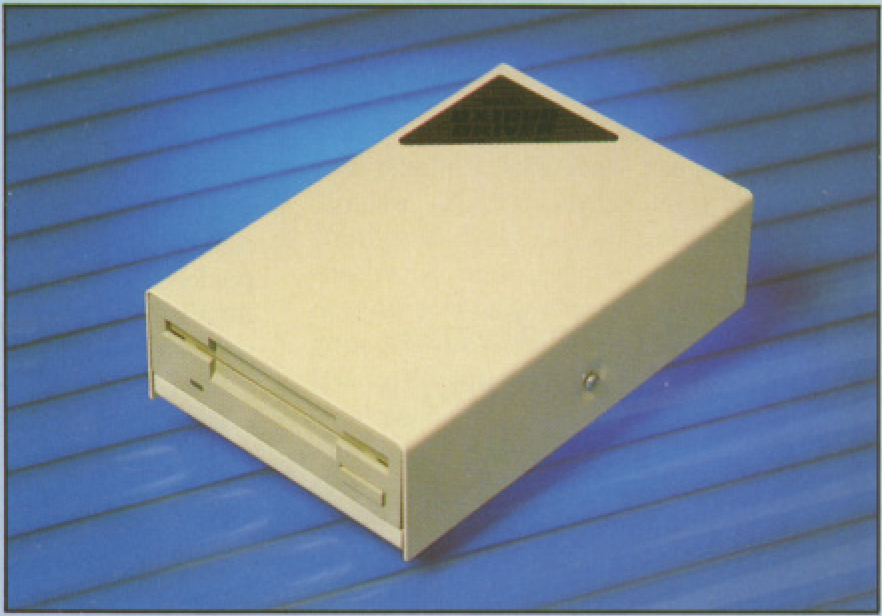
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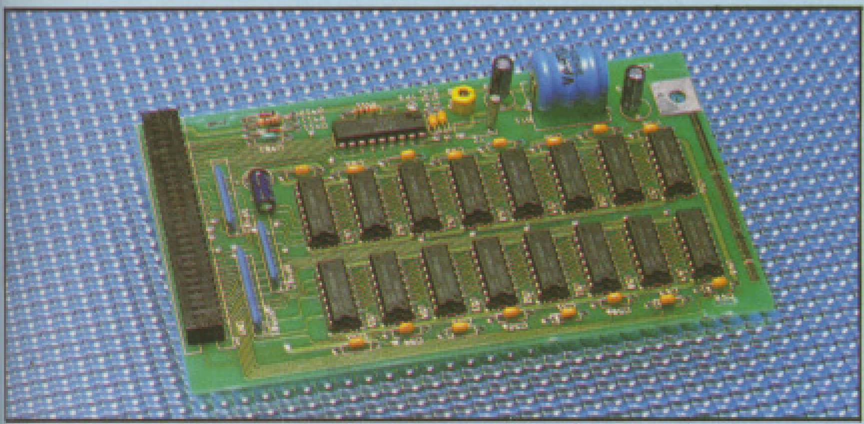
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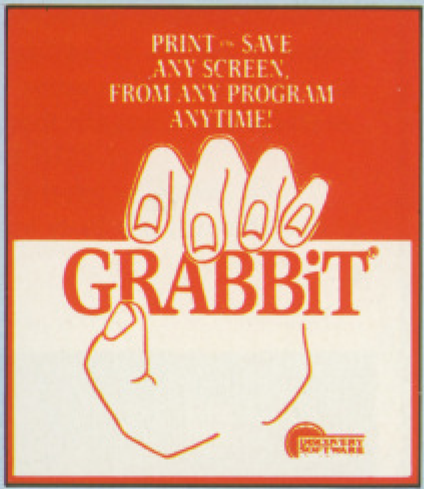
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Into the silicon u



Rupert Goodwins takes an electron's eye view of the inside of his Amiga. Follow him on a digital diversion

IN the depths of the Amiga manual, unseen and undiscovered except perhaps by a careless seeker after Basic error messages, squat the circuit diagrams. Page after page of close packed lines, a hieroglyphic maze of boxes and codes, they are the grimoire of that modern magician, the digital hardware engineer.

Luckily for us, the devils have been exorcised and the evil bugs vanquished – although there is said to be a guru in hiding. The innermost secrets of the Amiga can be laid bare without a thought for our souls. The spirits that animate the screen and utter the noises are entirely benign. For a guided tour of the silicon underworld, read on.

Appendix F, page F-3, is as good a place to start as any – three big boxes, a sprinkling of smaller ones and enough lines to set up in competition with the London Underground. It looks a mess and appears to be entirely unconnected with the green board and black chips inside the Amiga's case.

But each box on the circuit diagram corresponds to a chip, each thin black line on paper matches one thin green line on the board. And because all the information about the physical circuit is mirrored on the paper version, the hidden hows and whys of the Amiga design can be uncovered and used without ripping the computer – and the guarantee – apart with screwdriver and soldering iron.

Back at page F-3. The boxes are labelled in two ways: First with the chip type – as 68000 – and second with the part number U1. Why U?. Why not? The part number is only used by Commodore when building the Amiga.

The chip type is used by everyone, so asking for a 68000 will always get

you a certain kind of silicon, whereas asking for a U1 will probably end up with an early American spyplane sitting on your circuit board. Fine for flight simulators, but not so hot for word processing.

Take a closer look at U1. As keen Amiga owners are aware the 68000 is an advanced microprocessor chip capable of handling data in 16 bit chunks. In the flesh – well, plastic – it's actually about three inches of black plastic with 32 pins along each side, and on the circuit diagram it's even smaller.

The pins have names: There are some called D followed by a number, some similar but with A, and some with words. The ones with similar names – like A0-A23 – are grouped together; in fact on the circuit diagram they're all lumped together into one single thick line. These lines represent the buses – the lines beginning with A are address lines and go together to form the address bus, and the ones with D are data. Oh, you guessed.

Buses are based on the idea that in a computer, there are a lot of signals that do much the same thing. For example, the amount of memory that a 68000 chip can use is 16,777,216 separate locations, or 16Mb. To select one location out of those 16Mb needs 24 separate signals, any one of which can be high voltage – called a one – or low – called a zero. Why 24?

Well, imagine that long, long ago there was a computer with only two memory locations. Probably a Sinclair. To select either location, one address line would do the job; if it was zero it would select one location, if it was one, it would select the other. Now along comes the memory expansion box which doubles the total size to a massive – has to be a Sinclair – four locations. By adding another address line all four locations can be, er, addressed, as there are now four separate combinations of voltages – low low, low high, high low and high high.

So each time the memory size doubles you need to add another address line. And by the time you've got up to 16Mb you've doubled the original two locations 23 times. So there are 24 different lines all doing the same job, called the address bus.

The processor can select any of the memory locations by setting a pattern of ones and zeros on the address bus – on the circuit diagram, the address bus is called A(23.1).

Once that's been selected, the processor can read the information in ▶



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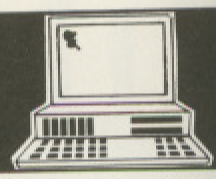
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it, or – perhaps – write some.

Memory is called memory because it remembers things – perhaps not a startling revelation, but most computer jargon has some common sense in it, even if it's well hidden. In the standard Amiga A500, there's 512k of random access memory (RAM) and 256k of read only memory (ROM).

Ram and rom are chips, of course. Looking at page F-4 there are two banks of chips (U16-31) and one big one (U6). This last one is the rom, and the rest are ram. You should be able to match the signals coming from the 68000 to those going to the memory, although some are altered by the Amiga's circuitry for reasons which will become clear later.

Read only memory contains built-in software like Kickstart and all the bits and pieces that provide standard functions to other, less permanent programs. After manufacture, rom can't be changed. Random access memory, on the other hand, only remembers stuff while power is applied, so when the computer is turned on the ram is effectively blank. It gets filled by the processor, provides video information, holds programs from disc, all that sort of thing.

While rom is self-explanatory, ram is a little odd – why not read/write memory? Further back than even the Vic-20, computers used strange devices to store information. One of these was the mercury delay line, which held data as a series of pulses travelling up and down a column of liquid metal. This data could only be accessed in order, or serially. When devices were invented that let the computer get at the information in any order it liked they were called ram to distinguish them from the delay lines. And the name stuck.

The information is held in memory, or in the processor, as another series of ones and zeros. There are only 16 data lines – the pins D0-D15 – but that's enough to represent numbers between 0 and 65535. In fact, the only other difference between real data and address is the bus, and by using the processor the programmer can swap information between the two at will.

Inside a digital computer everything is just ones and zeros. And again you should be able to trace the data bus (D15:0) between the 68000 and the memory chips.

There is another difference between ram and rom, this time more applicable to the Amiga. Whereas the rom, which contains instructions and data for the 68000 only, is directly connected to that chip, the ram is connected to rather more.

There are two reasons for this: The first is that the sort of ram in the Amiga is forgetful and needs extra hardware to help it remember – called refresh circuitry. The second is that as the ram contains sound and picture information the special chips (Fat Agnus, Paula et al) need to address it too.

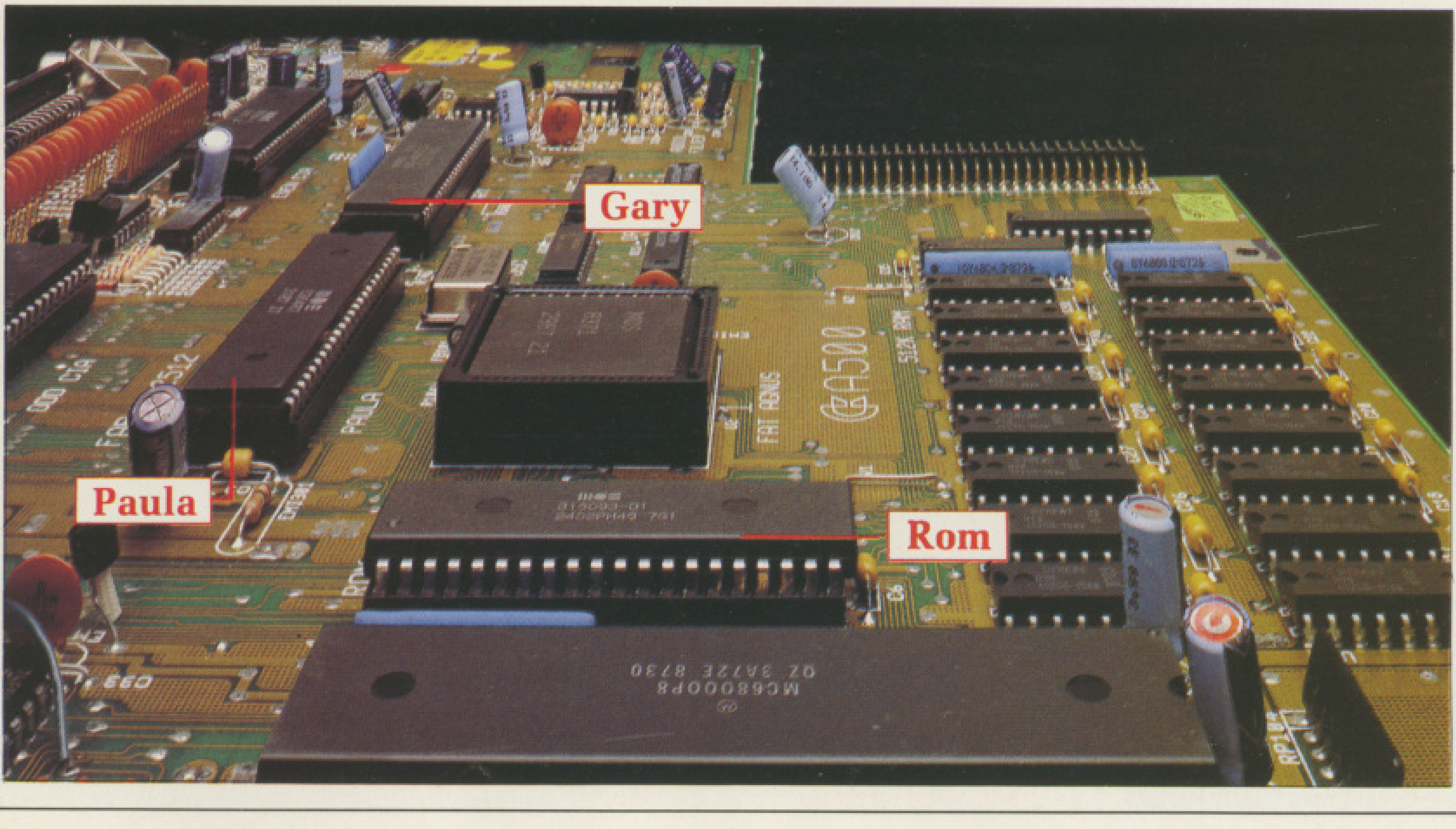
So there needs to be yet more circuitry to switch the ram between the various bits that want to get at it, and still more signals to control and synchronise the lot.

Some of the signals on page F-3 are attached to banks of resistors. Resistors – so called because they offer a certain resistance to electricity – are used to set voltage levels, and some signals need to be set to a certain voltage unless the chips dictate otherwise.The squiggles – for example, on signals _BR, _BG, _BGACK and _BEER – are resistors doing just that job. The other side of the resistors is connected to Vcc, an arcane engineers' abbreviation meaning the positive voltage coming from the power supply (PSU).

In the Amiga, as in most other small computers, Vcc is a carefully controlled five volts. Most of the chips are also connected to Vcc, a side effect of which is that if the power supply goes wrong it can take most of the rest of the computer with it. Be nice to your PSU.

And talking of power, look at page F-10. There's a huge chunk of

►



circuitry called Decoupling in which U1 makes a second appearance, this time as a small square box connected to two lines. These are Vcc and ground – the negative voltage from the PSU, between which are also connected a lot of capacitors.

Another standard electronic component, a capacitor, acts as a miniature storage battery and is depicted on the circuit as a pair of parallel lines. As decoupling components, they provide extra bursts of current when the chips demand it and also soak up any spikes of high voltage which might get past the PSU and would otherwise damage the silicon. It's a boring job, but somebody's got to do it.

We'll cover the details of the chips in a later article, but as an example of how to read the circuit in detail take a look at page F-9. Above the words *Reset Action* is a small chunk of circuitry based around U42, a chip called a 555. This is a very common component with a distinguished ancestry.

Designed in the early 1970s by National Semiconductor, it was also found – in a very similar circuit – in the very first Pet computers made by Commodore Business Machines.

It's a timer. By connecting it to a judicious selection of resistors and capacitors it can measure small periods of time quite accurately.

Because capacitors act as batteries, connecting one to a power supply via a resistor will result in it slowly charging up. As it does so, the voltage across it rises. The 555 detects when the voltage reaches a certain level – which happens at a set time after the power is connected – and switches an output from one to zero.

Most Amiga chips will only work reliably when the power supply is stable, and it only becomes stable a few fractions of a second after switching on. The 555 circuitry prevents chips from trying to work until it's all safe.

You should be able to spot where the power supply goes into the reset circuit, and the resistors and capacitors connected to the 555. The component to the right of the circuit – Q711, or 2SC945 – is a transistor. There are millions of transistors in the Amiga, it's just that most of them are hidden away within chips.

The 2SC945 is a rare example of a solitary tranny – like most transistors in a computer it's just acting as a switch. It has three connections called base, emitter and collector. A high voltage on the base – that's the one connected to the 555 via the resistor R701 – turns on the transistor and makes the collector voltage low.

Another term for this configuration is an inverter, because a high voltage on the input puts a low voltage on the output, and vice versa. While it's true that everything in a computer is either high or low voltages, embarrassingly it's often the case that something is the wrong way up. Well, it's 50:50 – inverters rectify this.

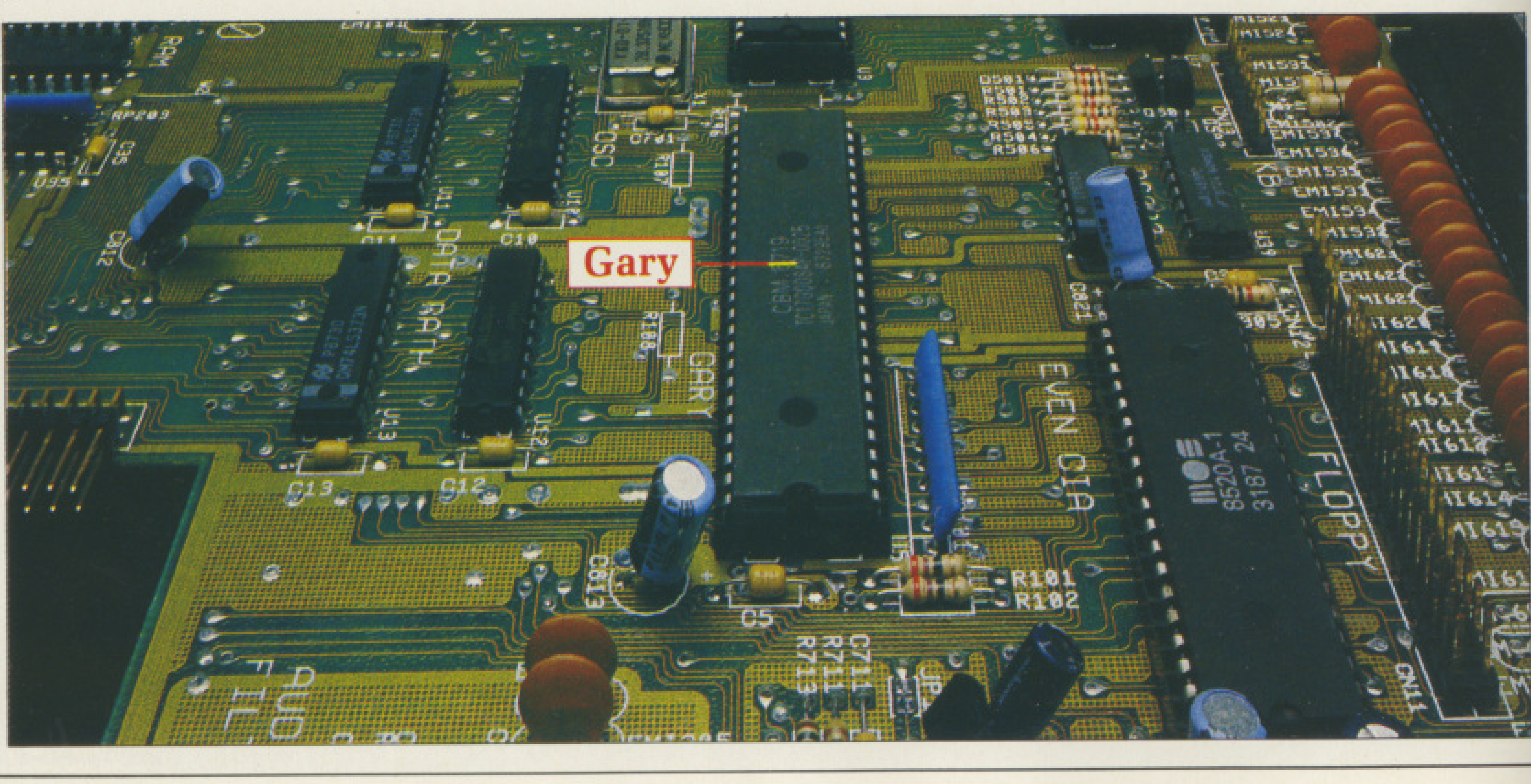
Incidentally, signals with an underscore in front of them are active – the computer takes notice of them – when they're low; so –RESET would reset the computer while it's low.

Finally, as an example of the sort of thing you can find out from the circuit diagram which the rest of the book won't tell you, take a look at the RS232 circuitry on page F-7. It's at the bottom right-hand corner. There are all the usual RS232 functions found on computers the world over – data in, data out, CTS, DTR and the rest, but there are two Amiga-specific functions AUDIN and AUDOUT.

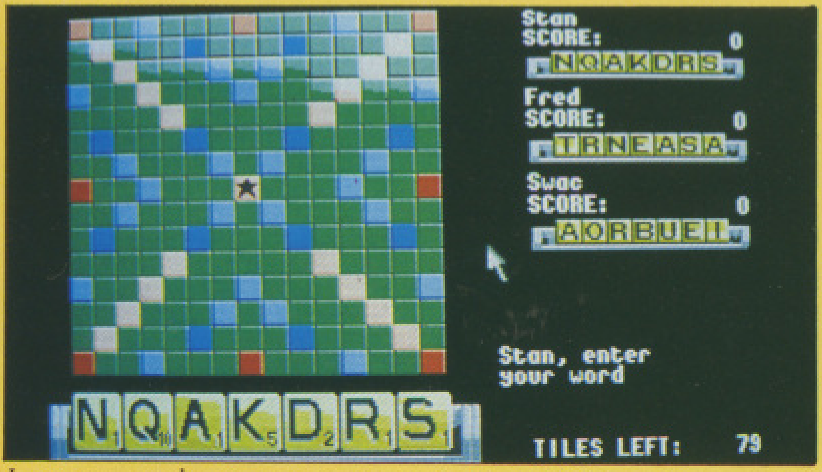
Scouting through the rest of the diagrams to find out where these come from reveals that they're hooked up to Paula and the rest of the audio circuitry. The AUDIN connection goes to the right audio output and thence to the speaker, and the AUDOUT comes from the left audio channel, from one of Paula's outputs.

The idea behind these is that with a very cheap modem you can hear what's happening on the telephone line through your Amiga's amplifier, and generate the tones to dial the numbers using Paula thus saving the additional expense of dialling and amplifier chips.

Interesting? Next issue Paula takes the spotlight, and the mystery voice is revealed. Don't miss it.



SCRABBLE DE LUXE



Increase your word power

APART from chess, converted board games don't usually sit very happily on the home computer, partly due to the difficulties of squeezing the playing board and other game paraphernalia on to a small screen and partly due to the problems of getting the computer to perform as a worthy opponent. Scrabble De Luxe is a notable exception.

Although Scrabble has appeared on a number of other micros, there is no doubt that the game board and pieces have never been better displayed than in the Amiga version. Board and tiles are large, clear and pleasant to look at – no squinting or reaching for the magnifying glass.

Two to four players, human or computer-controlled, can participate and any computer opponent can be given one of eight skill levels. The computer makes a tough opponent, having at its disposal a built-in dictionary of around 24,000 words. At lower skill levels, it is programmed to achieve around 150 points in a two-player game and will only access a sub-set of its dictionary. At the higher levels, it will search the whole dictionary and is tuned to reach an average of over 300 points.

Play can progress without any time limit, but you can make life harder for your opponents by setting the clock option. This will restrict the time allowed for each move, between 30 seconds to five minutes – the snag is that the limit also applies to you. When your time is almost up, the clock starts flashing an alert. There is no audible warning – indeed, there is no sound at all in this version.

You may elect to view the computer's thought processes: This lets you see the word, value and possible position on the board currently under consideration by the computer.

At your discretion, the tile racks on the right hand side of the screen may be hidden so that only the current player's main rack will be displayed at the bottom of the screen. In this case, other players must avert their eyes – another drawback to converted board games.

Options available during the game from pop-down menus – and, in a few cases, by keyboard command – include being able to obtain a hint from the computer, pass your turn by, juggle the letters in your rack, change tiles, force the computer to move, and display the tile distribution and the values of the tile set and premium squares.

One good feature is that uncompleted games can be saved for later resumption, but it is a pity that saves always have to be to the program disc: Try removing it during play and replacing it with a blank for saved games and the program crashes with an error.

Two other small criticisms of what is otherwise an excellent conversion: The mouse pointer seemed a mite sluggish for my taste and the options to see the computer thinking, hide the racks, set the clock on and off and change skill levels are only available at the start of a game and cannot be altered once you've begun.

The computer plays a mean game, particularly on the higher levels. I never knew there were such words as qua, zatis, zoeae, goyim and filet. There's no doubt that the game's finest feature is the huge vocabulary of two to four letter words – and their extensions – and the program's speed of response.

Scrabble De Luxe is an attractively presented and stimulating program. Any word-game afficionado will return to time after time. Playing a tough, ever-ready, artificially intelligent opponent is a pleasure and who knows – you just might end being more literate into the bargain. Now of how many programs can you say that?

Bob Chappell

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Overall – 84%



You can cheat and use a dictionary – the computer will never know

STAR RAY



The early levels are the prettiest

LOGOTRON is not the first name Amiga users associate with super-fast Arcade shoot-'em-ups, but that could all change in the not too distant future following its first Amiga release, Star Ray.

The game was programmed and developed in Germany under the working title of Sting Ray, and after nearly 12 months of constant programming, testing and debugging has arrived sporting a new, more appropriate name to match its non-stop arcade action.

The scenario is similar to the legendary coin-op, Defender, released in the arcades some seven years ago. The objective of that game was to defend the planet's population from invading aliens who practiced strange methods of mutation on the humanoid population.

Star Ray is much the same, with you taking on the role of an intergalactic fighter pilot who must defend the ground installations. Where Star Ray seeks to differ from its arcade peer is the scrolling.

Defender had smooth and fast horizontal scrolling but it chugged compared with Star Ray's super fast, super colourful "quadralax" scrolling. This uses four scroll fields and on later levels produces a quite exhilarating effect.

The game is divided into seven levels, each representing a change in scenery and new waves of progressively more hostile aliens.

The first level is a beautifully illustrated marshland set in prehistoric times. The gory explosion effect when you shoot one of the aliens is totally cool.

Further into the game there are the brilliant cave network and the crypt-like ice world. Other screens pall by comparison. Your fighter, equipped with a standard laser, can collect other weapons and raw materials which allocate strange but effective enhancements.

It's not quite in the Nemesis style of increasing the ship's firepower, but improvements which can be made include vaporisers which destroy everything on the screen, energy reboosters and immortality capsules.

As well as being able to improve the performance of your intergalactic fighter you can take advantage of certain features that contribute to the game's overall presentation.

One such example is on the final level where by shooting randomly can result in radar jammers blocking the scanner.

The more you play Star Ray the more you appreciate the class and quality of the most exciting shoot-'em-up to be made available for the Amiga.

The audio and visual effects are truly superlative.

In short, Star Ray is quite simply exhilarating and addictive.

This a great title with which to kick-off Logotron games.

Chris Holmes

Star Ray
£19.99
Logotron

Sound
Graphics
Gameplay
Value

Overall – 70%



The use of four scroll fields produces quite an exhilarating effect

THEXDER

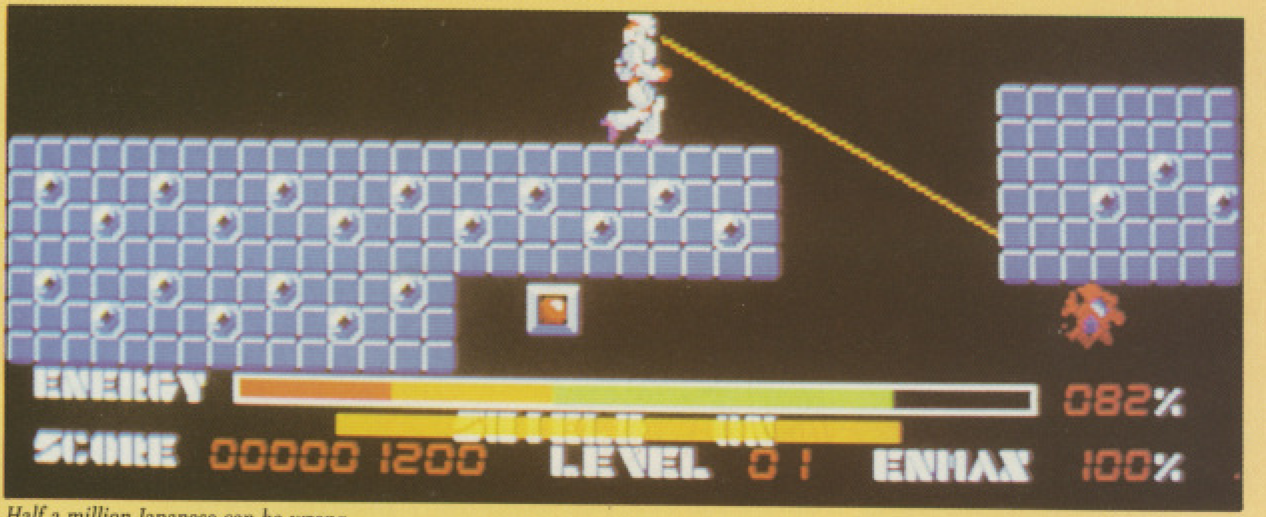
IF the name Thexder means absolutely zilch to you then you obviously aren't one of the 500,000 Japanese gamers that have made it one of the best selling titles in the land of the rising sun.

If you believe the claims on the packaging, Thexder is a game that was designed for 16 bit processors, and its colourful animation and hypnotic music will seduce even the most jaded computer player.

Maybe so, but if you aren't brain dead you will quickly realise that Thexder has been converted from the PC by Sierra-on-Line, a company that wouldn't know how to make good use of a 16 bit processor if it leapt up and bit it.

Thexder is heavily derived from the world of Japanese comics and cartoons, which explains the paucity of plot. You are trapped in a world with 16 levels and must disable the central computer at the end of the road to escape.

As Thexder the robot you can change into Thexder the jet, and so fly over ground-hogging foes. The trouble is that while it is easy to turn into the jet, it is also far too easy to return to robot form, which usually happens when you least want it to.



Half a million Japanese can be wrong

Like when you're flying over an acid pit.

For defence there's a shield to keep the riff-raff away from your shiny Thexder, while for offence there's a an auto-aim laser cannon. One press of the fire button and laser fire shoots out at every enemy on screen in turn. Yes, even if one is right next to you you'll have to wait until the laser finds its way round to it.

Actually this laser fire gives the impression that Thexder is lashing the opposition with spaghetti, which might have been a good laugh if that had been implemented. As it is, it simply looks like third rate programming.

If you like classical music, specifically Beethoven's Moonlight Sonata then Sierra has torture in store for you. It accompanies the action, becoming more frenzied as things hot up. But unless you're deaf you'll have turned it off by then.

It all sounds like bad news so far, and that's because it is. But there is one small treat in store: The entire first level is not only mapped, but contains instructions on how to get through in one piece.

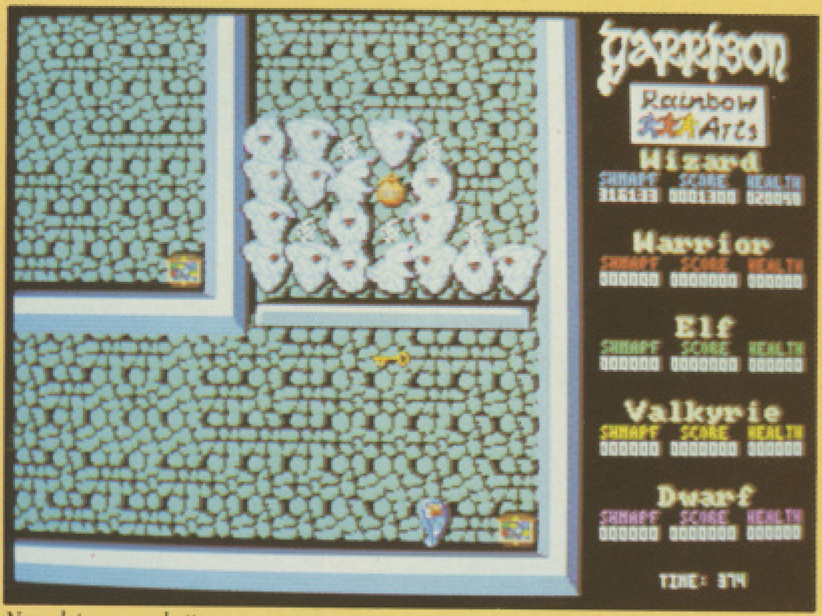
Apart from that, this is a pretty dismal offering with as much depth as a puddle and all the elegance of a Sumo wrestler. **Mark Luckham**

Thexder
£19.95
Activision

Sound
Graphics
Gameplay
Value

Overall – 30%

GARRISON II



New data means better maze

THE program that saved US Gold the trouble of trying to program Gauntlet on the Amiga returns. Rainbow Art's Garrison was so much a Gauntlet clone that the Birmingham mob gave them little choice but to sign up. Fabulous sampled music on the gothic title screen, hundreds of sprites, slow but worthy scrolling, and endless hours of mindless entertainment made the original program a "must have" purchase for Amiga owners.

There were a few flaws with Garrison I, not the least of which was all the player characters looking the same unless you had a one meg machine. But if you thought that Garrison II would sort them all out, think again.

Yes, despite being sold for another £25 as a standalone program, the so-called sequel is indeed just another set of 128 levels in a castle. To hammer home the point, you can use the program disc from G I with the data disc from G II, and vice versa.

The only differences are that a rather pokey loading screen has been added, the plot has changed, and that a bit more thought has been expended on some of the designs for the levels.

The new story is that the princess has fallen ill and five of her trusty lackeys have been charged with recovering a healing herb from the top of a magician's 128 storey tower.

Whether there is in fact a herb is open to conjecture, since there's no way that I can get anywhere near the top, and I doubt very much that any one else will either. Garrison II is hard with a capital H.

Although I liked the original music, it's a bit of a con not bothering to change it – every sound effect has been faithfully reproduced.

At least the levels are more fun now. The invisible mazes were extremely frustrating, and I haven't come across one in the new version.

It's obvious that the programmers have a rather vicious sense of humour. When you have experienced the level called Deluxe Pain 2 you'll know what I mean.

Garrison II is recommended, but not if you don't have loads of money, or have Garrison. If you have the original you'll have to answer the question, do I cough up £25 for a new data disc?

It is a pity that Rainbow Arts hasn't improved the gameplay in areas like letting four players on screen simultaneously. Maybe we'll get that in Garrison III.

Anyway, it's still a cracking program, and nearest thing you are ever going to get to Gauntlet on your Amiga. **Mark Luckham**

Garrison II
£24.95
GO!

Sound
Graphics
Gameplay
Value

Overall – 69%

AAARGH!

HOW many Amiga gamesters are tired of playing the hero all the time? Now is the time to reveal your innermost, wicked ambitions.

A little more offbeat in your computer entertainment, maybe just occasionally you would like the chance to play the bad guy or in the latest Melbourne House creation, a wicked monster.

Aaargh! is probably as screwy as anyone could possibly hope for. Bearing an uncanny resemblance to the Rampage coin-op, it has been developed on the basic ideas used in the money muncher and given a sense of purpose and depth that the arcade lacked.

The story takes place in a time of ancient mythology when monsters really did exist and men were simply used to keep them quiet by providing suitable nourishment.

The two monsters upon which this game is based are the one-eyed Cyclops and a Godzilla-style Lizard.

At the beginning of each game you can choose which of these monsters you wish to use to wreak mayhem and destruction on the various locations within the game.

Each monster is able to unleash hefty blows by punching up, down and sideways in order to demolish the various buildings and towers. They can also breath fire which will burn houses and other adversaries.

The purpose of smashing the abodes in each location is that when the house or tower crumbles it reveals a prize that will either replenish your monster's energy and fire-breathing abilities or ultimately present the much sought-after egg.

This will take the monster on to a special bonus level where you fight it out monster to monster to win the coveted egg.

This short interlude works quite well and makes a change from the main game action.

I particulary liked the Neanderthal roar when one of the monsters triumphs and holds the prize above its head.

As you progress through the game the location changes and the enemies become more hostile. In later levels giant insectoids zoom in and out of the screen trying to bring you to your knees with a fatal sting.

These levels require a fair amount of planning; you must destroy wells which provide villagers with water to put out fires. The simple solution is not only to destroy the wells but also to eat as many villagers as possible, giving you great personal satisfaction and a boost to your energy supply.

Aaargh! really is a solid piece of entertainment. The graphics are superb. The sampled roars and grunts enhance the theme of mindless destruction.

Chris Holmes

Aargh!
£19.99
Melbourne House

Sound
Graphics
Gameplay
Value

Overall – 67%



Mayhem is the recipe for success

LEATHERNECKS

ONE shortage of games available for the Amiga is the Rambo style shoot-'em-up which puts one ever-so-brave soldier against a whole army.

Microdeal's latest game is in this style with one notable exception: Leathernecks doesn't only allow one player to participate in mindless destruction but, with the aid of the special joystick interface from Microdeal, four players can participate at the same time.

This novel approach of enhancing the gameplay is theoretically a very sound idea, but when put into practice it just doesn't quite seem to work.

The main reason is the small screen size; when four sprites are overlaid they tend to get in each other's way.

Leathernecks is nonetheless a thoroughly stimulating one player game, probably the best arcade action program released by Microdeal.

Leathernecks was programmed by Steve Bak, one of the first to push the ST to its limits. He has made an effort to improve the Amiga version of a 16 bit game while converting it.

The main improvement lies in the sound department, where Amiga Leatherneck truly excels. The music was programmed by David Whittaker, who is rapidly taking over Rob Hubbard's mantle as the most demanded computer musician in the software industry.

One of the major reasons why Leathernecks will be a success is the simplicity of gameplay. The objective is to progress up the screen destroying as many enemy soldiers as you can as they attack in large clusters.

The weapons at your disposal are a machine gun, grenades and a rifle. Each weapon has its advantages so by swapping between the three progress is made easier.



Simple gameplay makes an exciting shoot-'em-up

As a first attempt at this type of game on the Amiga, Steve Bak as produced a very admirable program. The graphics although ported from the ST, are adequate, and some of the colouring is very effective.

The sound effects are atmospheric and enhance the rather mundane and somewhat repetitive gameplay.

Leathernecks is not the best game on the Amiga but far from being the worst.

If you want to audition for Rambo IV give it a try, you won't be disappointed.

Chris Holmes

Leathernecks
£19.99
Microdeal

Sound
Graphics
Gameplay
Value

Overall – 57%

BUGGY BOY

IT'S not every day that you find a completely non-violent game that manages to combine speed, skills, and excitement with simplicity, but Buggy Boy has managed to deliver the goods in fine style.

Coin-op conversions too often fail to reach the standards of the originals. The same can not be said of Buggy Boy. All the qualities that made this Taito machine so popular in the arcades have been skilfully ported across to the Amiga. Elite is to be congratulated on a first rate job.

The scenario is simple. You are in charge of a cute four-wheeled Baja buggy and must drive it around a number of courses, earning points as you go. Controls are equally simple – using the joystick, push forward to accelerate, back to brake, left and right to steer and the fire button to toggle between low and high gears.

Five selectable courses run through differently stylised landscapes. Every course is broken down into five legs – you must complete each one within a given time limit before you'll be allowed to continue to the next.

The view of the action is from high above and just behind your buggy, mud spurting from its wheels as it picks up speed. Your progress around the course is charted on a map at the top of the screen where other information, such as time remaining, score, gear selected and speed is also displayed.

The roads are mainly split into three driving lanes – you can drive outside these but your buggy slows up considerably. Drive through wide, bunting-capped gates and past short coloured flags to earn points. Extra points are gained by hitting the flags in the prescribed order shown at the top of the screen. Gates labelled "Time" will add a further two seconds to the limit allowed to complete the next leg – if you make it that far.

The biggest problem to fast and unimpeded progress is the sheer quantity and type of obstacles – some of them so cunningly placed that you'll need quick wits and fast reflexes to avoid them. Boulders, heaped tyres, trees, fences, timber stacks, cacti, and street lamps will flip your buggy over if hit, causing it to spin and come to a swift stop.

Valuable time is lost when you drive off the highway into the sea or a lake – your buggy disappears with a splash, floats up and repositions itself back on the road. Smacking straight into a solid wall results in your buggy being replaced by a short burst of flame – the only disappointing graphic effect – then reappearing in mint condition at a point beside the impact.

Adding enormously to the fun are dark and winding tunnels, sloping embankments which you can gleefully drive your buggy up – like a wall-of-death rider, footballs which take off like scalded cats when struck, puddles of gunge which momentarily slow you down, and logs which when hit, surprisingly send you soaring through the air – handy for leaping obstacles.

And most fun of all are the mole-hills and tree stumps which, when struck, tip your buggy on its side allowing you to zip along on two wheels for as long as you can keep it in that position. This technique is essential for dodging round some of the more fiendishly placed obstacles.

Assuming you make it through one leg of the course in time, there's no rest – you race straight on to the next stage. A pause facility on the left hand mouse button useful. The joystick hand begins to wilt after five punishing, non-stop legs.

Nifty sound effects, jolly jingles, bright colours, clean and cute graphics, fast and smooth action and a well varied content makes Buggy Boy a joy to play. The challenge of completing all the courses and then trying again and again to better your score ensures that this is a game that will not soon be consigned to the attic. A lively and lovely, non-violent game. Nice one, Elite.

Bob Chappell

Buggy Boy
Elite
£24.95

Sound
Graphics
Gameplay
Value

Overall – 81%



Elite is to be congratulated on a first rate job

RETURN TO GENESIS

PHIL Collins Abandons Solo Career Shock! No, but I'll bet that band is still going in the year 6600, where this game is based. The plot goes slightly like this . . .

The Genesis Project was a group of synthetically altered scientists and their clones who took over a region of space and proceeded to shower mankind with all manner of benefits – joysticks that didn't get sticky when you ate pizza while playing games, antigravity... that sort of thing.

Then came the invasion by some nasty aliens who boffin-napped the lot. And you, Group Captain O'Rourke, have to fly there and rescue them, save mankind, blow up the Zorkians, all that sort of thing.

That was the plot. This is the game – piloting a small spaceship with a gun at the front through a series of convoluted screens, picking up little men and women who wave at you while avoiding the nastier sort of explosive and zapping anything that moves. Forget the O'Rourke bit, and remember Defender.

The play area only takes up about half the screen. Above it is a nicely chromed score area, and below a radar map of the entire current maze, with little glowing blobs signalling the men to be picked up and little white blobs the homicidal maniacs.

They fly towards you and try to either blow themselves up on your hull or lob a glowing life-re-liver at you. You can shoot the aliens, but the bombs are untouchable.

If you hit the surroundings while you're flitting about, you bounce – audibly – and reverse direction at full speed. No damage ensues, but only if a nasty hasn't materialised behind you.

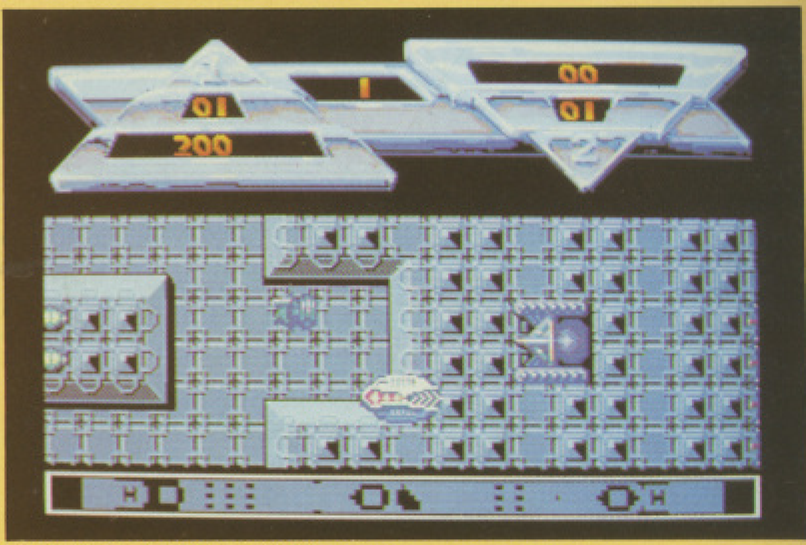
As some of the protrusions are set up in a zig-zag pattern some inspired joystickery is needed to get from A to C without reversing into a shortly-to-be-ex alien.

The scientists you pick up could well be carrying their favourite project. There's a list of who does what in the small booklet that comes with the game.

Once you've got the guys in the hold, you can use whatever it is that they've brought along – extra guns, time-space dilators, turbochargers, Alien-O-Death aerosols. You guess what it does and you can use it to your heart's content.

There are lots of levels, all very nicely drawn and with a wide sprinkling of hazards and different flavours of humanophobe.

The game is very, very speedy. With the high level of on-screen obstacles and low level of freedom of movement, it's very easy to accelerate too far and end up in a chicane going the wrong way far too fast.



Continuing the hunt for a scientist

The graphics are wunderbar, the sound less so. Although the audio is initially impressive, after a bit it becomes clear that the Amiga's capabilities aren't being stretched overly. The occasional voice sample livens things up – "Well clear" announces Amy as you polish off yet another screen.

Lots of points for a good, clean, exciting codeup of an old, old, old game idea. Not a lot of points for originality, but shoot-'em-up addicts aren't going to care about that.

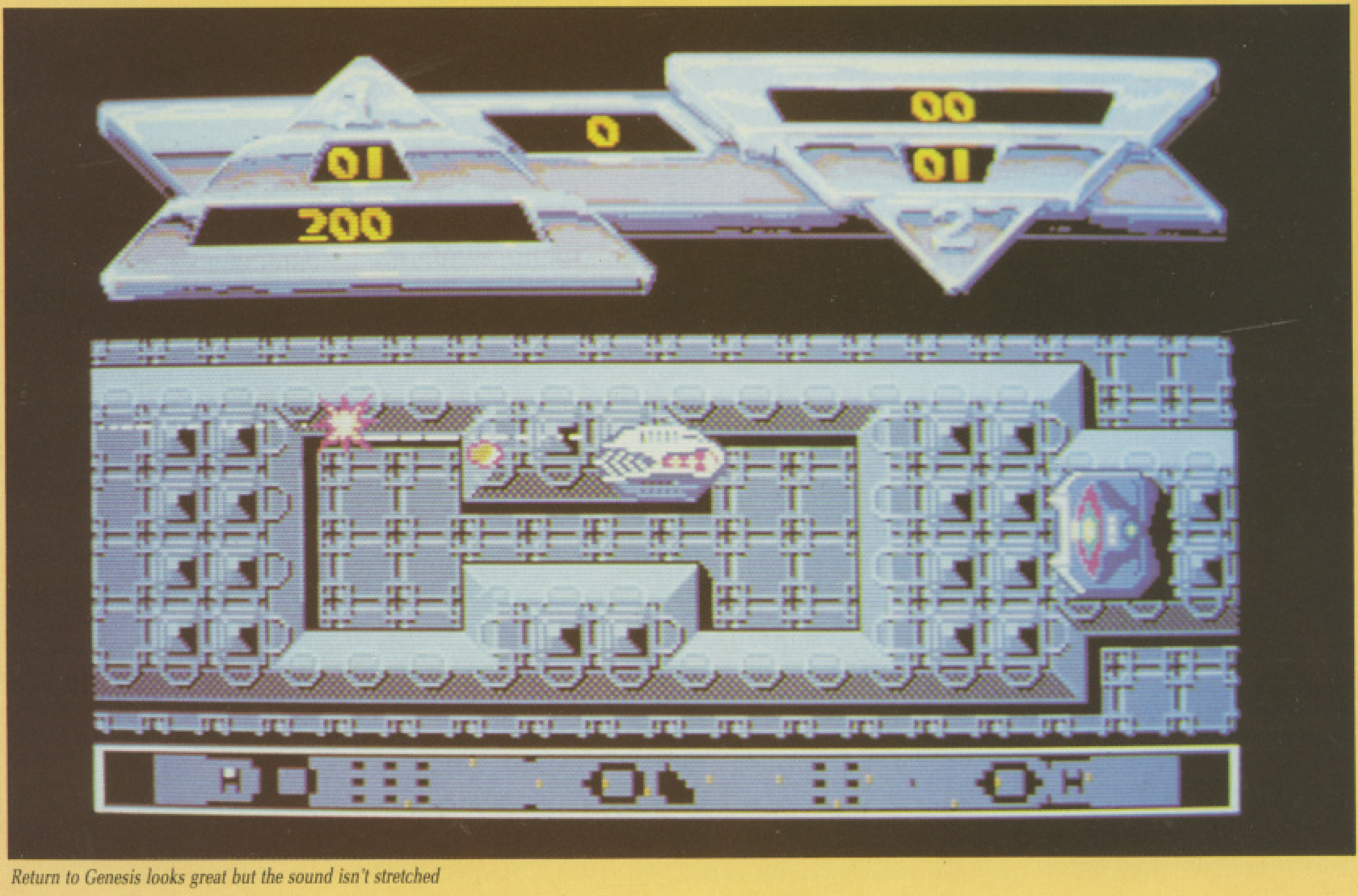
Parting shot. Why is the disc called Goldrunner when you look at it in Workbench? Is it because the author, Steve Bak, was also responsible for Goldrunner? We shall never know, Captain.

Rupert Goodwins

Return to Genesis
Firebird
£19.95

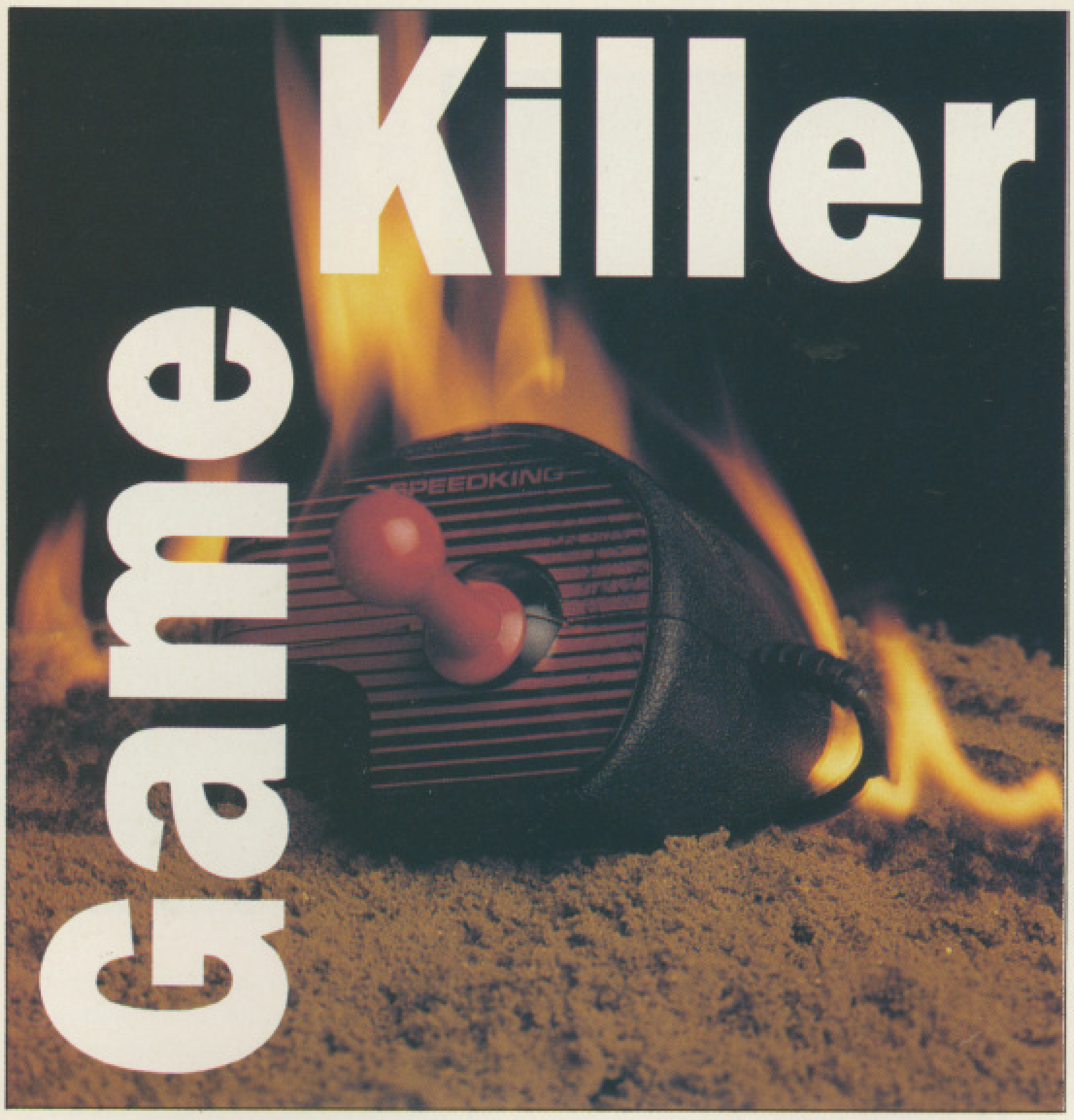
Sound
Graphics
Gameplay
Value

Overall – 71%



Return to Genesis looks great but the sound isn't stretched

Game Killer



Max "The Hacks" Tennant is the master of game play. Whatever the game he'll win at it, fair means or foul – often with a little help from his friends. If you have a tip for a game send it in. For every one we print we'll send you a game from our goodie drawer – together with a Konix Speedking joystick

FIRST up is Adrian Curry, who wins his second Konix with his tips for Firebird's Black Lamp. Hunting down a collection of lamps is not as easy as it may seem, especially when you have to dodge deadly dragons, watch out for wicked witches and slink past sordid slayers.

Try and keep your collection of shields and weapons equally topped up. Then if you manage to bring both of them into use at the same time, Jolly Jack can go on the rampage, stomping through all the nasty creatures. This does no end of good to your score.

You need to know how to deal with the evil beasts to be found in the land of Allegoria. The buzzards drop exploding skulls. As soon as one of these creatures appears, walk in the opposite direction to the one in which it is flying. Then, just before the buzzard reaches you, turn around and walk the other way. This fools the aerial attacker into dropping its deadly cargo early, missing you.

The exploding thistledown which the crafty crow drops is the last thing Jack wants on his quest for the lamps. Stand still when the crow appears. Then once all the poisonous plants have been fired, jump in the same direction as the crow is travelling, avoiding the shower from above.

The Imps can be li'l devils, a real pain in the butt with their extra sharp tridents. Creep up behind them and backstab these lesser demons.

Such tactics could be foolhardy against a Slayer. You will normally see the lightning bolt from the Slayer's sword before he enters the screen. Jolly Jack has two options: Stand and fight like a man, firing all the time in the direction from which the Slayer approaches, or run away to fight another day.

The dragonflies and wasps dive bomb Jack at the most awkward of times, quite often in large numbers. The best thing to do is work your way to the source of the trouble and blast them back to their hives, making sure you take care of any incoming insects en route.

The werewolves do not always attack – they might not be hungry. But be prepared for one of these lycanthropic creatures to jump at your throat. This is the best time to attack, so strike just as it leaps through the air.

When you enter the dragon's lair try and work your way to the top-most level on the screen and blast the dragon. Fireballs are not the best thing for Jolly Jack's health so invulnerability collected from the magic shields can be helpful when tackling reptiles of old.

ADRIAN's next set of hints aim to keep you from losing your head in Palace Software's Barbarian, battling against the powerful arch mage, Drax. The game consists of nine levels: Forest, wastelands, glade, wastelands, throne room, the pit, throne room, the pit and Drax, the final conflict.

You can use various tactics on Drax's swordsman, but as you progress through the levels they improve, and so must you, as their skill at countering your tactics increases.

In the early levels the enemy is unsure of your strength. You can take advantage of this and try some daring tactics which you may not be able to get away with on higher levels. One such manoeuver, which can prove to be very impressive, is the flying chop.

A favourite tactic on the early levels is to roll into the opponent's corner, trapping him, then kneel down and chop away. As you progress to later levels the swordsman may try and kick you out of the way. You can counter by kneeling far enough away to avoid being kicked but not so far that he can roll past you.

The wizard Drax poses a different

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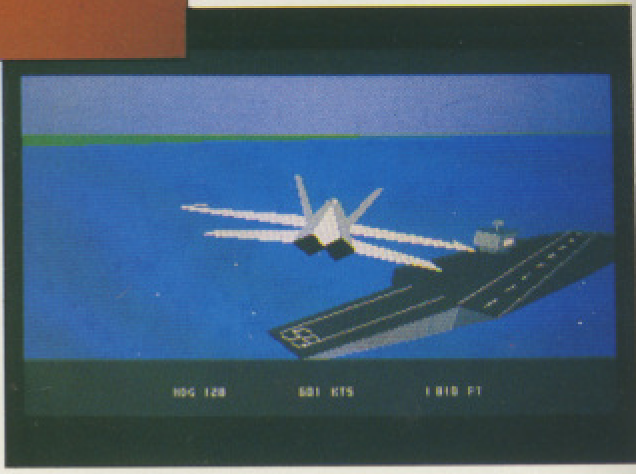
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problem. He is not the hardiest of men and can be slain with a single blow from your broadsword. But he is a magic user and there lies the rub. For Drax will cast fireballs laced with instant death should they hit you.

You will have to be quick witted: Jump, crouch and roll your way past the fireballs until you come within sword's reach of Drax. Only then can you fulfil the hopes of the peoples of the jewelled city and win the Princess Marina.



Join Jolly Jack in his struggle



Saving the world – F/A-18 style

THE final hint comes from Steve Jenkins, an Interceptor whiz. Anyone who has spent some time playing with, rather than playing, Interceptor, will have discovered some of its clever features.

Flying under the bridges is fun, if not particularly rewarding pointwise. Look out for the Electronic Arts offices in San Mateo, just to the west of the long grey bridge. You can land in the car park and blast the buildings. They will smoke but you cannot destroy them.

This information comes in handy for the last mission. For those players who have not got that far the plot involves a submersible aircraft carrier – and that is the source of all your foes throughout the game. Sink the submarine to complete the mission.

This is not a simple task as the submarine is a tough cookie and you need to hit the conning tower with six missiles. Flying low to avoid detection is not always successful, and you will need to tackle the enemy fighters. Remember to gain height before getting into a dogfight.

When you have visual confirmation of the sub, lose height and take aim at the conning tower. The foe's electronic countermeasures mean that you have to get quite close before firing. If you are out of missiles you can use the gun. Damage the sub and it will start to smoke which means it cannot launch any more aircraft.

By now you will be low on ammunition. Even if you have a few missiles left it is advisable to leave the wounded sub and head for your carrier. Take out any enemy aircraft you spot on the way back, land and re-arm. On the last mission this should present few difficulties.

Return to the fray and avoid entering dogfights as you will need your weapons fully loaded. Back at the sub you will need to get six missiles into the conning tower. It is possible to land on the sub, which makes targeting missiles easier, but you need to come in very slowly.

Winning at Interceptor is most satisfying. There is a slight feeling of anticlimax as you miss the challenge – it is like finishing a good book – but there are plenty of things to experiment with. Have fun.



Heads frequently roll in Barbarian

If you have any hints for Max "The Hacks" Tennant write to him at Amiga Computing, First Floor, North House, 78-84 Ongar Road, Brentwood, Essex, CM15 9BG. Remember to include your name and address so that he can send you a Konix Speedking joystick if your tip is published.

Power to your Amiga windows

Designing a user interface for the Amiga can be a laborious task. Richard Franklin assesses a package that could easily make this a thing of the past



HAVING programmed the Amiga in C for about a year, I have had to suffer designing input window displays with Deluxe Paint, using the zoom option to get the coordinates and then laboriously enter them into the required Intuition structures to be included in my program.

Powerwindows Version 2.0 offers the Amiga programmer a luxury his Atari ST counterparts accept as normal. This is a resource construction program which takes the tedium out of creating menus and dialogue boxes – the ST equivalent to Amiga requesters.

The first step is to decide whether you wish to use the Workbench or a custom screen. Unless you want to use the Workbench you have to define your screen type and size.

This allows you to specify the characteristics of your display such as resolution, title, number of bitplanes, dual playfield, or HAM.

Once the screen has been defined, you have to delineate its windows and colours. The style for the input is similar to that in Preferences, where you select the colour to alter and then move a slider up or down to change the red, green and blue contents.

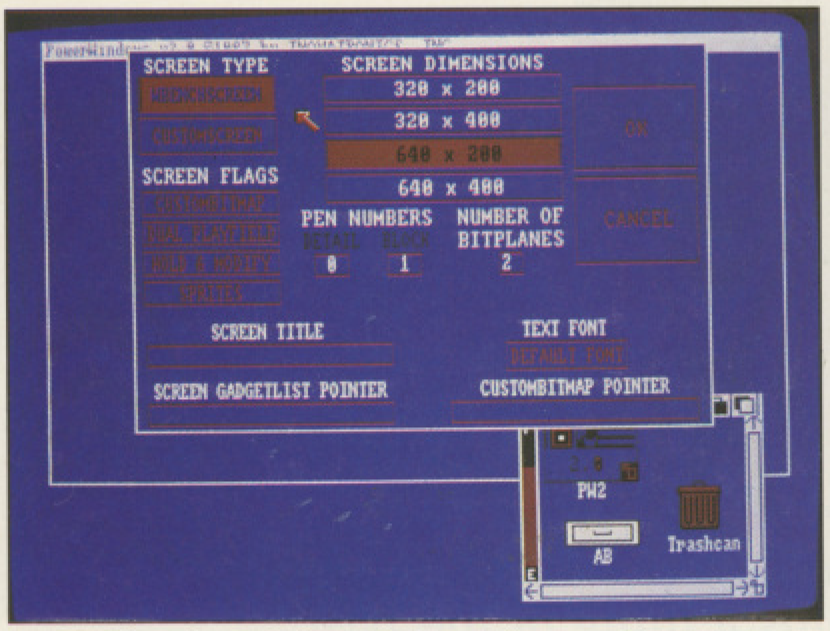
The vertical resolution is fixed at 200 – 400 in interlace – pixels. This is because the program has not been designed with PAL systems in mind, a problem which should be cured if Inovatronics want the program to work correctly with the new resolutions included in WorkBench 1.3. The hardened hacker can fix this with a debugger, or use the PD program Overscan, to overcome this problem.

Once you have chosen your screen, you can start adding windows. First select Open New Window and a small window appears. Then select Edit Window Characteristics and you get a requester with buttons allowing you to choose the different flags. IDCMP (it stands for Intuition Direct Communication Message Port) and display flags are included so that you can set exactly the style you require.

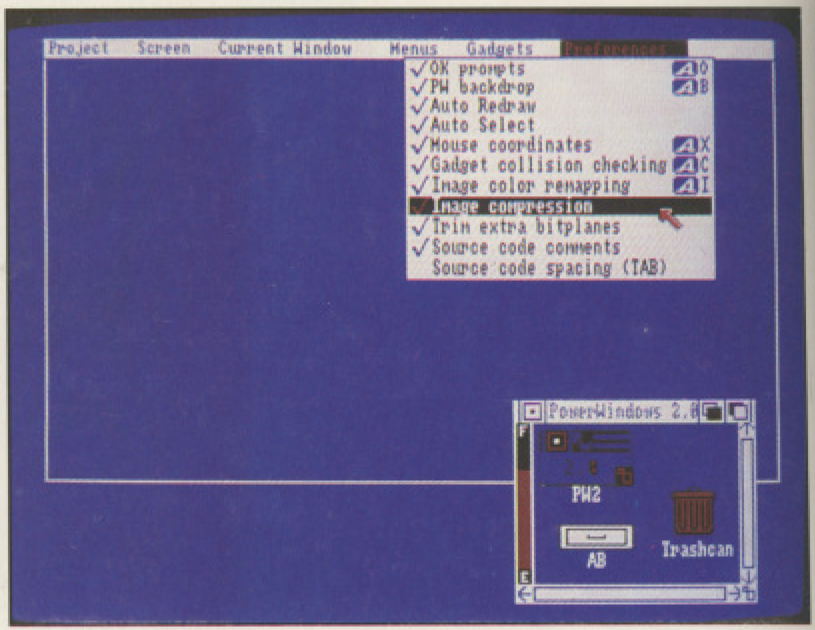
There are input options for setting the current, maximum and minimum sizes and the window's title. Text is added by imputting the actual lines, positioning them on the window, and then editing the features such as drawing mode, colour and font.

One nice feature connected is the ability to grab a window from another program. This provides a menu of all the screens currently open in the system, and a list of all windows, as sub-items, on each screen. Just select the required window and a copy appears.

Menus can be created by first ▶



Defining the non-workbench screen



A wide range of options

◀

entering their titles and then working on the actual items. Each can have sub-items attached which can be arranged in columns of up to nine items. Setting of mutual exclude bits is easily done by pressing the right mouse button when editing. You get a single menu with all the items that can be mutually excluded – including the one you are editing – and you just select the ones to be excluded.

All positioning and sizing of the drop down menu areas is calculated for you, but you can turn off the automatic option and set the dimensions yourself.

To view the menus created, click on any of the system gadgets on the window to which they are attached and the menu will appear as though the program was running.

You can create any of the available gadget types and put them anywhere inside their windows. The first thing to do when defining a gadget is to select the position in the screen for the top left corner and then move the mouse to pick the size. This is shown as a rectangular box which moves with the mouse.

While you are sizing the gadget, x and y coordinates are displayed on the screen. There is an option (default ON) for collision checking with other gadgets but I found that the positioning was impeded so much that I turned it off.

Once you have positioned and sized your gadget you can edit different characteristics, such as highlight. At the same time you can also fine tune its position and size.

There are options for adding Texts, a Border, Render and Select imagery to the gadget. The limitation of just one border per gadget is annoying, especially considering that they have implemented lists of text for the gadgets. The borders may be square, rectangular or freehand.

Images may be included in the gadget's display, menu items and sub-items. The images must first be designed using an art package such as Deluxe paint and then saved off as a brush. PowerWindows can read the brush IFF file and include it in the gadget or menu item.

Be warned. You can't have borders and images on the same gadget and if you set one, the other will be lost without warning.

The most important part of this program is the Save option. You can, and should, save a file readable by PowerWindows V2.0 for future editing. You can save the data in source for either Assembler, Lattice C, or Manx C. The manual states that there is a conversion program on the disc to create Modula 2 source but I couldn't find it. Instead I found one to convert to AmigaBasic.

A readme file explains that converter programs for other languages are being developed and will cost $19.95.

Apart from the lack of PAL screens, the program is quite usable, albeit a bit awkward in places as you have to move the mouse quite a bit – even with the OK prompts turned off. The gadgets are awkward to position and size on a high resolution screen. The sizing routines would have been better if they showed relative x and y rather than absolute coordinates.

This is a useful program, and I will most likely make use of it, but it would have been nice to have had a zoom option when positioning and sizing gadgets. It is a sensible programmer's tool.

REPORT CARD

Product PowerWindows Version 2
Supplier Inovatronics/HB Marketing
0895 444433
Price £69.95

USEFULNESS
A programmer's godsend, makes light work of the toil needed to produce a user-friendly front end.

EASE OF USE
Designed for programmers rather than users, and necessarily complicated to use, tries to make life painless.

INTUITION
As a tool this does not need the nice molycoddling features of a users package but still keeps to the rules.

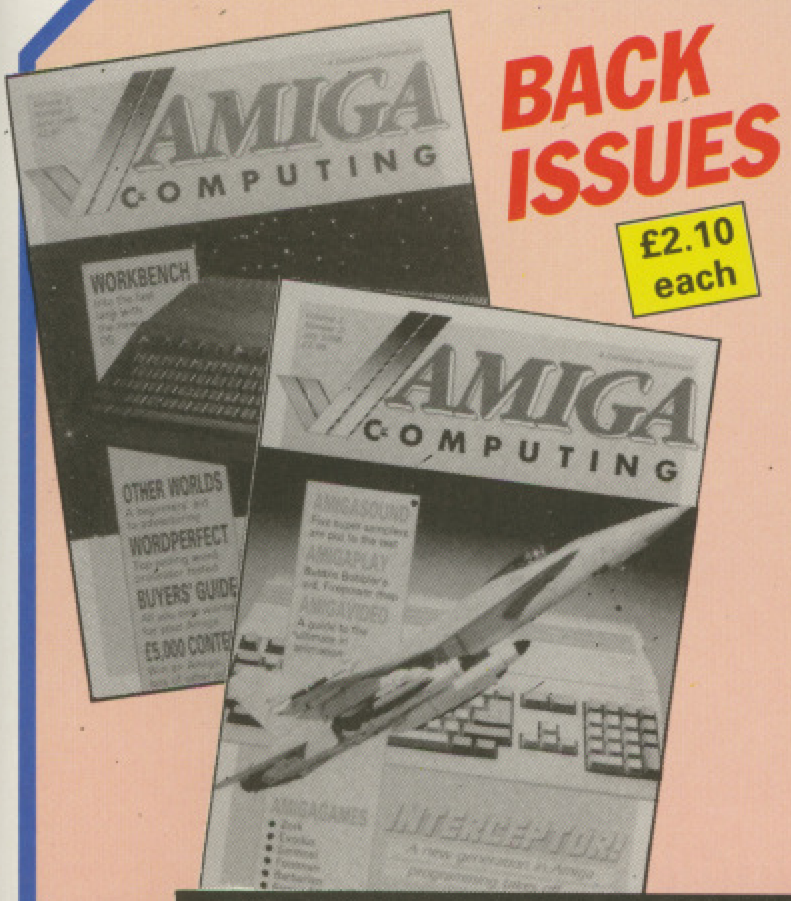
SPEED
No complaints, but then the program does not need to work very fast.

VALUE
In the hands of a busy commercial programmer PowerWindows 2 will pay for itself within a day or two.

OVERALL *64%*

Valuable to a small number of people writing applications programs.

AMIGA COMPUTING Mail Order Offers



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June 1988 issue

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July 1988 issue

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TO ORDER PLEASE USE THE FORM ON PAGE 65

Amiga, speed king

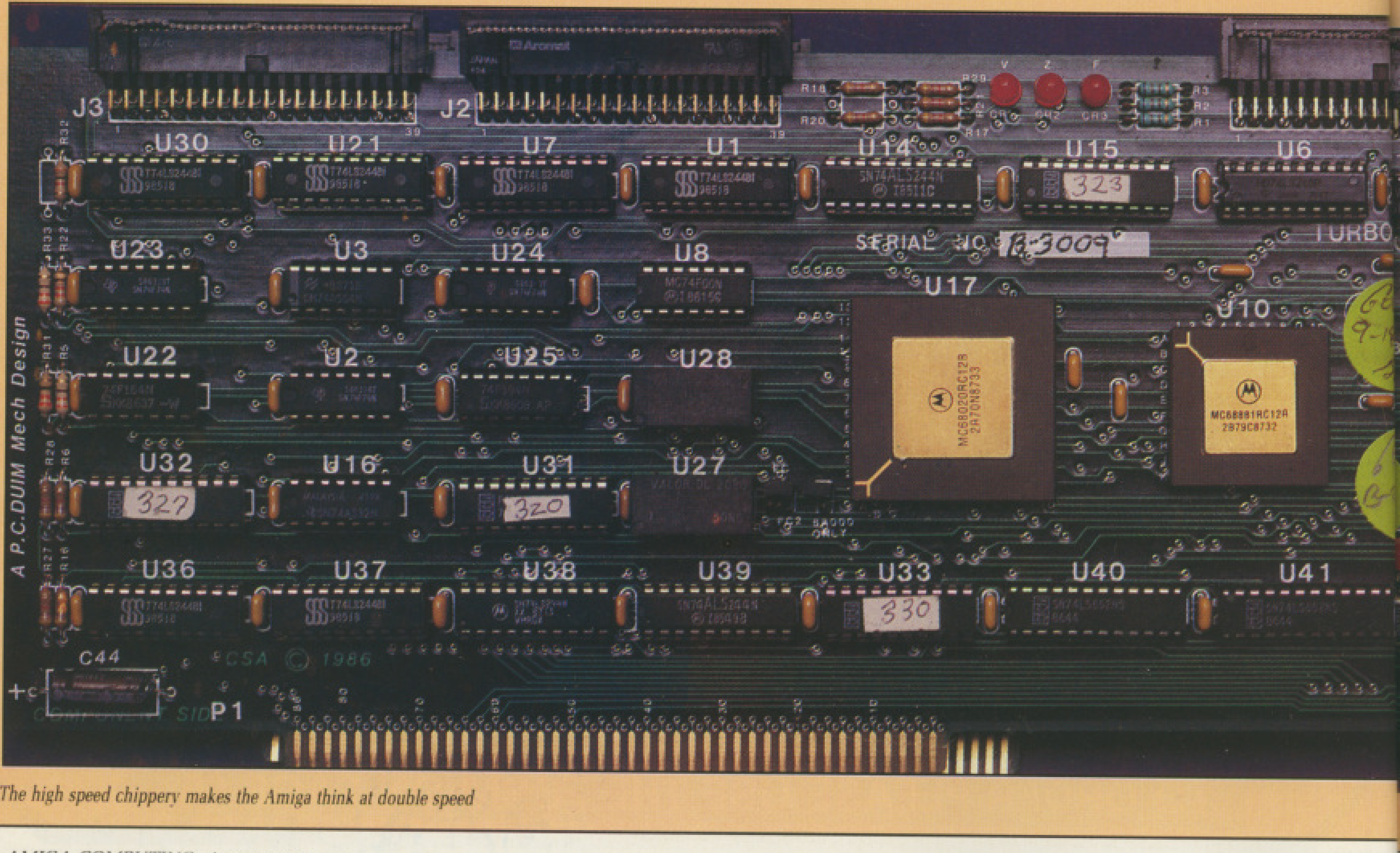
Imagine being able to add an engine to a Ford Escort which would make it do over 200 mph. The Computer Systems Associates board does a similar thing for the Amiga 2000. Jez San takes it for a test drive

COMPUTER Systems Associates is an American company specialising in acceleration cards for micros. It offers various money-no-object ways of upgrading your Amiga – or Macintosh – far beyond what the manufacturer envisaged. Since both the Amiga and Macintosh have those same standard 68000 processor chips it must have seemed obvious to CSA that its products are almost identical on both these machines.

The Motorola 68000 series of micro processors is a reasonably large family of chips. Luckily they are all reasonably compatible, which says a lot these days. Especially since Intel – of 8086 family fame that IBM PCs use – keeps making its chips totally incompatible with each other unless you use the special compatibility mode.

The slowest Motorola one is the 68008, crippled with an 8 bit bus which means that data goes in and out twice as slowly as normal. The Sinclair QL used that one (sigh!). Next in line is the 68000 which is the stock 16 bit standard part, followed closely by its slightly faster brother the 68010.

There is at best a 10 per cent speed improvement between these two, and they are plug-compatible. This means you can swap one for the other with about five minutes of spare time work – and most of that is spent in removing the screws in an A2000 case, then figuring what to do with the heavy metal case after it's off . . .



The high speed chippery makes the Amiga think at double speed

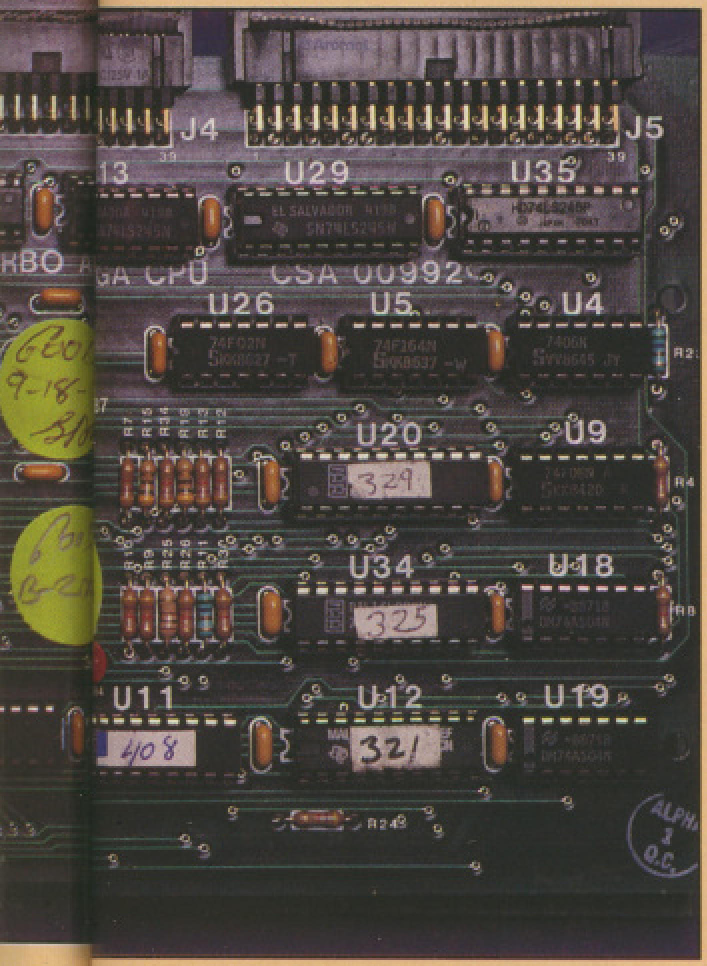
its *always* too big to fit on the table.

The next Motorola beastie of significance is the 68020, which is a 32 bit microprocessor. That means it is excellent at shuffling large amounts of data around which is good if you are shuffling 32 bit and bad if you are using 16 bit data. It can be a positive disadvantage at times.

The other nifty new thing that the 68020 has over its little siblings is an Instruction-Cache of 256 bytes. That is, it will remember the last 256 bytes that it saw in ram. This feature can make your programs run faster because it speeds up some software loops by remembering things it had done recently – like in the last few microseconds – and recalling them more quickly than if it had to read the user ram for them.

The Amiga A2000 runs its 68000 chip at 7.2Mhz. This is the time taken for a cycle to occur inside the microprocessor which is linked to the speed at which instructions are executed. So in general, the faster the clockspeed is, the faster your programs will go. Motorola 68000s can be bought that go as fast as 12Mhz, but if you want to go any faster you need a 68020.

You can buy – very expensive though these may be – ones that run up to about 25Mhz, which as you can imagine is significantly faster than the Amiga was designed to go. The CSA 68020 card runs itself at a convenient speed of 14.4Mhz – convenient because it is exactly double the Amiga's speed, which must have simplified design work somewhat.



We borrowed one of CSA's mega fast 68020 cards together with an extra 2Mb of ram designed especially for their own use. These two cards were stapled together with gratuitous amounts of ribbon cable and had to plug into an A2000 such that they both were very near one another – almost too near.

The '020 card plugged into the Amiga's 86 pin Processor socket, and the ram card plugged into a normal A2000 slot, connected together by overhead umbilical cords the like of which you may never see again.

SIMPLY plugging a double-speed 68020 into an Amiga does not necessarily make everything run at double-speed. The reason for this is that the 32 bit 68020 chip has problems working with 16 bit quantities, as found on the built-in rom and ram of the Amiga. So it must make two attempts at each access to ram because it likes to work in 32 bit chunks, but the ram will only supply it in 16 bit chunks, twice.

For this reason, when running programs in normal Amiga ram, it's possible for the 68020 to go even more slowly than the old 68000 did, because of the need to do twice as many ram accesses. The double-clockspeed usually makes up for this, especially for the more sophisticated programs that do a lot of multiplying and dividing – a very slow thing to do on a computer.

The 68020 chip really flies when it's given nice fast 32 bit ram to play with. CSA's 2Mb 32 bit ram card is very expensive, because it uses the unnecessarily expensive static ram chips instead of the far cheaper, and smaller, dynamic ram chips. Quite why CSA did this is beyond me. I can't believe it was through lack of knowledge.

Still, the card works. Plug it in after setting the myriad of jumper connections to suit your tastes and boot up. CSA supplies a special program which lets the Amiga know about its extra 2Mb ram card.

As long as the CSA '020 is running programs in 32 bit ram they will run approximately four times faster. Alas, there are a lot of Gotchas to that speed.

Whenever the Amiga wants to do something on the screen, to draw graphics or write text to it, it will be using 16 bit and it will slow down to a crawl . . . and whenever the Amiga's operating system (Intuition) is being used, since it is held in rom this is 16 bit memory again.

Although the 68020's Instruction Cache will get it out of tight corners, there are a lot of reasons why the 68020 won't run at full speed. There are so many things that can cause the 68020 to find itself looking at 16 bit memory that it's a wonder that CSA doesn't provide a way of putting the Amiga operating system into its own 32 bit ram. This would make any OS function, including graphics and text print speeds, run at least twice as fast.

One of the nicer points of the 68020 is its ability to use the Motorola 68881 floating point co-processor chip – try saying that while chewing gum! This chip speeds up maths functions, but only if the program you are running knows how to use an '881 and also knows that it is there – most don't.

Some programs were written especially for this chip: There are versions of Sculpt-3D and a few languages – versions of Fortran and C you can buy that take heavy advantage of the '020 and'881 combination.

THE approximate speedup gains with a CSA 68020 card can be considerable, if it is used properly and efficiently. Things can be from two to four times faster in terms of running application programs, and maths can be up to 100 times faster in some cases. So if you want to run math intensive programs, make sure you buy special 68020/68881 versions of them, and they will run like a dream.

At the beginning I mentioned that computer manufacturers could never envisage the power that the 68020 and 68881 could bring to the Amiga. That's not true, Commodore has. Continously or not, Commodore has designed its computers and operating systems so that they can take a 68020 with minimal changes. The 1.3 operating system is just around the corner, and with it comes a new set of ▶

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math libraries that will automatically detect if a 68881 is connected to the machine, and make fullest use of it.

This means that any programs that you run will automatically run a lot faster, without any changes being made to them. Of course they can run faster still if changes are made to talk direct to the 68881 instead of relying on the OS to do it for them.

Commodore plans to launch an '020 card of its own pretty soon. Called the A2620 it will contain not only 68020 and'881 but also a 68851 memory management unit (MMU) which is designed to look after multitasking. This will do things which the operating system can't. If one program crashes in a system without an MMU the whole system dies. With an MMU just that application is locked out.

The Commodore card will be much like CSA's, but will have 32 bit dynamic ram and thus be much cheaper than the CSA offering. We hope to review this soon. In terms of specification, it will be almost identical to CSA's with the added advantage of being able to replace the Kickstart operating system into 32 bit fast ram, thus alleviating one of CSA's main bottlenecks. That way, all graphics and text will be four times as fast, too. I hear the Commodore card will also come with Unix – which should please some people.

So, did I end up liking it or not? I'm not sure really. I think it's hugely expensive for what it does. But on the other hand it does offer speedups, sometimes quite dramatic. Depending on your use it may well be worth paying through the nose to get Mac II-like performance from your Amiga, but I can't help thinking that the Commodore one will be half the price, and possibly a better product.

The CSA board suffers from timing problems when using the Commodore hard disc – I'd expect the Commodore one to be a better bet. However, if you are heavily into maths, and are running compute-intensive programs – no, not Defender of the Crown! – and if you can afford it, then sure, go ahead.. make CSA's day.

Alternatively you could wait for CSA's new 68030 board which runs at 28Mhz!

REPORT CARD

CSA 68020 card
Amiga Center Scotland 031-557 4242
£2,000-£5,000 depending on configuration.

USEFULNESS ....
Most people could use a faster computer.

EASE OF USE.........
A bit fiddly setting up for an A2000, easier on a B2000.

SOFTWARE...........
Works with the Addram patches. Workbench 1.3 will speed mattersTEXT

SPEED.....................
Sure it's fast. Doubling the speed gives spectacular results.

VALUE ....
But not fast enough to justify the price.

OVERALL 60%

A rich man's toy, or math fan's tool.

Dealing Dos a wild card

Phil South continues his plain man's guide to CLI



WILD cards are single letters added to commands which allow you to give known information about a file, but leave unknown infcrmation to be searched and acted upon by the computer.

There are two types of wild card in AmigaDos, the first the asterisk *, and the second the hash and question mark #?.

Hash and question mark are among the most useful things in AmigaDos, so I'm quite surprised to see that they're hidden away in most manuals under the LIST command. There are other uses for the symbols, notably in the area of filing.

The meaning of the hash and question mark symbols are as follows:

<p> matches none or more occurrences of the pattern <p>.

? matches any single character.

Let's see how we use these two symbols.

Their intended use is to perform searches in the LIST command, such as:

LIST PAT A#BC matches AC, ABC or even ABBC
LIST PAT A?B matches AAB, ABB or ACB

So you see that in combination their effect would be to search for any number of occurrences (such as the # symbol) of any single character (the ? symbol).

This means that you can type a character or short intro to a filename, and just put #? to let the computer look for the rest of it.

Say, for example, you wished to delete a set of files ending:

DELETE #?.info

at a CLI prompt. Be warned, this doesn't prompt you as to whether you want to rescue any of the .info files on the disc, it just nukes them all indiscriminately.

If you want to be a little more specific, you can try this one:

DELETE d#?.info

so every .info file beginning with d like doctor.info, derek.info, dude.info and so on, would all be deleted unceremoniously. If you wanted to directory only those files ending in the postfix .library the command would be:

DIR #?.library

or if you were feeling really lazy, then how about this:

DIR #?.lib#?

A real timesaver when copying files, especially troublesome ones with spaces is:

COPY DF0:system-configuration TO DF1:

Try this one instead:

COPY DF0:#?-config#?

which will achieve the same result. Incidentally, copying your system configuration file from one bootable

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disc to another transfers all the disc icon and pointer design. So you can borrow all those good pointer designs and workbench colours from other discs.

THE asterisk introduces special characters into filenames, like space, equals, plus and quotes.

If you include them in one of your filenames you have to not only enclose the whole filename in quotes, but also embed asterisk symbols in the text of the filename, introducing the special characters, so AmigaDos knows they are inert.

So:

filename G*H = D

should be typed as:

"G**H = D*""

to avoid confusion when it is saved.

That is one use of the asterisk. Another, and more interesting, purpose is for representing the keyboard and the current window. It is in this rather obscure sense a wild card character.

Let's take a simple example of asterisk, like:

```
COPY * TO PRT:
```

This is a silly little hack which turns the Amiga and the currently defined printer into a sort of typewriter, directing all information typed from the keyboard on to the current window to the printer, a letter at a time as it is typed.

Take another example:

```
DIR > temp
SORT temp TO *
```

This DIRs the files on the currently mounted and CDed disc to a file called temp, and then SORTs the file and prints it up on the current screen.

What do you mean, you've never heard of the SORT command before? This prints up a temporary sorted listing of the contents of your disc.

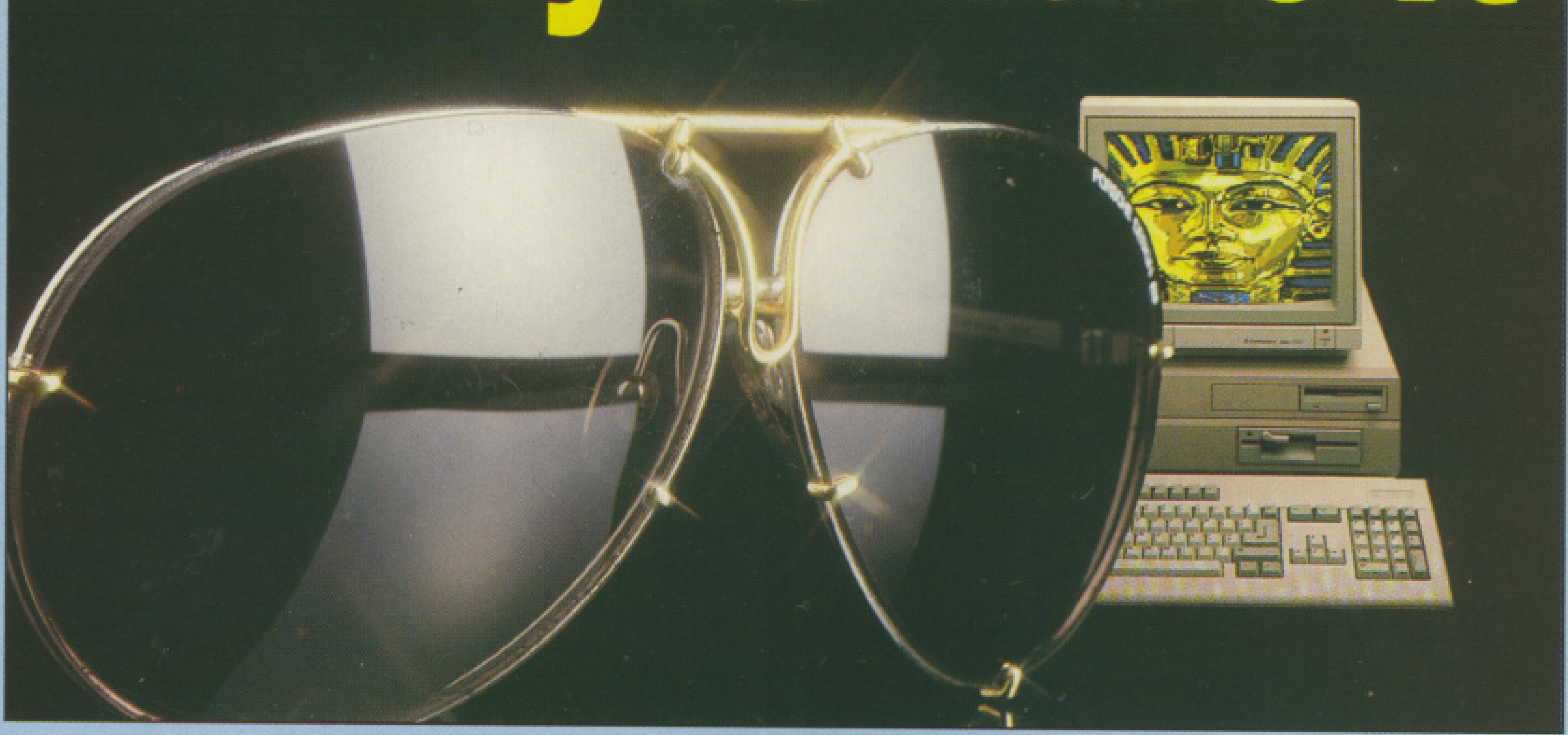
It would be possible to add this command to your s/startup-sequence so that every time you booted a disc it would give itself a quick DIR, sort it out and print it up for you.

I DID, and it drove me bonkers in a very short time. So take my advice and don't bother.

But the possibilities for screen handling and quick and dirty text shifting are stupendous.

● *That's all for this month. I hope you'll find these tips useful in your future dealings with the CLI. If you have any questions involving CLI or AmigaDos, please drop me a line. Send your missives to: Phil South, Amiga Computing, 78-84 Ongar Road, Brentwood, Essex, CM15 9BG and I'll see what I can do to answer your problems.*

The eyes have it



FlickerFixer . . . a curious name and a high price, but what does it do? Jez San saves his vision and checks it out

THE FlickerFixer stops the annoying tremor in the Amiga's highest resolution interlace video modes. The flicker is so bad that the modes are not usually used. Commodore's preferences has an option to turn on flicker... er, interlace. This is the first product which has given a purpose to that option.

Microway, an American company, made its name selling IBM PC number crunching chips, from the 8087 maths coprocessor all the way up to the Weitek mega-fast boards.

Microway (Europe) was set up in Kingston – England, not Jamaica – to represent its out-of-USA interests. To this end it is doing rather well, with knowledgable guys at the helm like technical director Nick Spicer.

Recently Microway diversified into transputer cards and claim to have sold more transputers in cards than even Inmos itself. Its hugely successful MonoPuter and unreleased VideoPuter are IBM PC transputer cards which turn a lowly humdrum IBM PC into a machine with mainframe power at "low" cost. That doesn't even consider the QuadPuter which has *four* transputers on a single card.

Microway, having established itself as a performance enhancement company, has turned its attentions to the Amiga market. There must be Amiga enthusiasts deep within the company, because it is unusual to see a large corporate company like Microway considering the Amiga as a potential market.

The FlickerFixer is a compact card full of ram that connects into the video slot to the right of the power supply on a B2000, the new improved American version of the German-designed A2000. It still says A2000 on the box, of course, to pretend it is still the same computer. But it isn't.

The major differences are a redesigned Amiga motherboard, more expandibility and a refined bus. New products like the FlickerFixer often only work in B2000s. Fitting the card is a fiddle – it needs to be shoehorned into the space, avoiding the chassis for the 5.25in drive.

Remembering your PAL video lessons at school, you will recall how we have 625 lines on each video frame of a normal television display – only 525 in the USA. This consists of two successive frames of 312 lines each, the frames alternating every fiftieth of a second on to interleaved scanlines to give the impression of a double-resolution display at half the frame rate.

Since most television pictures are filmed by an analogue camera we don't notice any flicker, thanks to clever lighting, nature's colours, and vidicon camera tubes which tend to smooth out the image. This can be done under software, but takes a big mainframe many hours, costs millions of pounds and is called anti-aliasing.

The flicker problems occur when digital computers try to display static pictures on television screens using interlaced video frames. Computers are too precise. They can put graphics on one scanline that might not be smoothed out on the next. This causes the TV screen to flicker when interlaced as the graphics appear and disappear each fiftieth of a second.

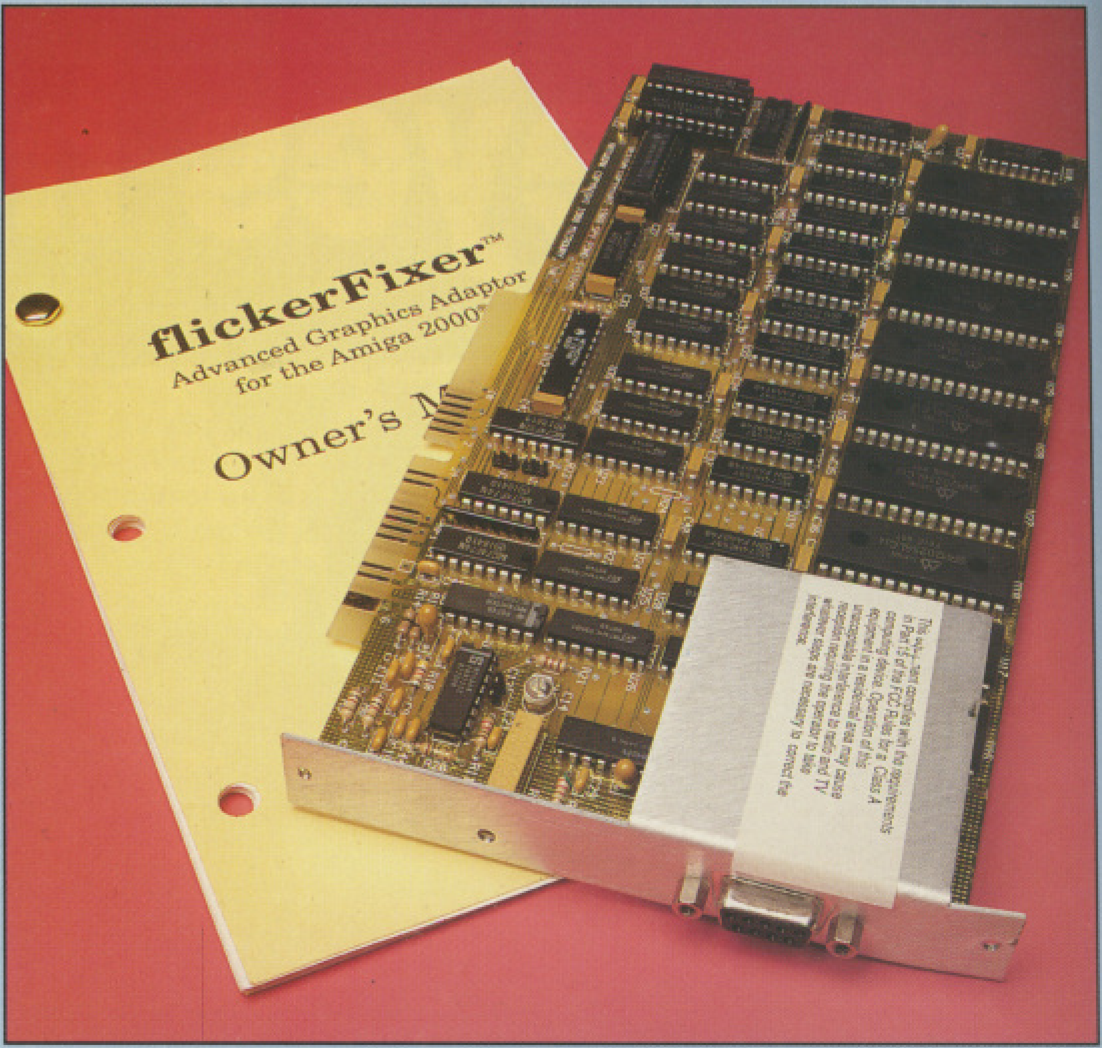
The solutions have always been drastic: Either display the same image on to both interlaced frames, thus halving the resolution, or buy an expensive long persistence monitor which smears the image so that it ▶

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tries to retain one of the interlaced frames even while the next frame is being drawn. This has the disadvantage of not running too well with animation or movement, and the smears are very disorientating.

Peter Selverstone, a bright spark at Microway, came up with a digital way of buffering up one frame while the next one is being displayed and then displaying both at the same time.

There are a few problems. Frames displayed at twice the standard rate require a higher frequency monitor – a television or standard 15 KHz PAL monitor just won't do. What you need is a 31 KHz monitor with a non-interlaced 640 by 512 capacity instead of the usual 640 by 256. Luckily this non-standard video format already exists in the IBM world – EGA monitors can handle these video frequencies. Unfortunately they only support a fixed set of 16 digital colours, and not the beautiful 4096 that Amiga allows.



These chips buffer frames to produce a clear display

Some EGA monitors are switchable to analogue, but the answer for most of us will be a multi-sync monitor. These clever toys look at the video signal coming in, and will usually be able to cope with it.

They are expensive – the best known monitor is the NEC MultiSync which has a recommended price of around £800. A cheap multisync will dent the bank balance to the tune of around £500, almost double the cost of a normal Amiga monitor. The hope is that multisync monitors will come down in price with added competition. However, due to the extra circuitry needed they will always be premium priced.

I tested the FlickerFixer with a few interlace demos. Microway supplied some almost forgotten Amiga pictures, including the famous Mandril, but it wasn't quite what I remembered. The results were stunning – it had miraculously lost its flicker.

More serious uses of this product include desktop publishing or CAD work, where the added resolution of Amiga's interlaced modes are needed and the users want to use the system all day but cannot live with sore eyes and headaches.

The card isn't cheap. You need a solid use for the extra resolution of interlaced modes before rushing out to buy one. To most of us, it's a convenience product. You don't really need it, but once you've got it you wouldn't give it up.

If you are one of those people who can afford FlickerFixers, genlocks, video toasters and frame grabbers, you may have to mix and match your peripherals. Commodore only supplied one video slot, which I'm sure it will regret when the vertical video markets start crying out for simultaneous use of the multitude of hot new video cards.

FlickerFixer is a quality product, well produced and nicely packaged. It works perfectly – no quibbles. Just make sure you buy the PAL version if you want to use it for the full-sized display.

Would I buy one? Yes, if I needed it. There are bound to be many professional Amiga users who sit in front of their machines all day long who will pay for the increased resolution and comfort FlickerFixer can give. It's a great solution to a problem that afflicts higher end users.

FlickerFixer will become a prized purchase for anyone who is running XCAD or Professional Page, programs used by people who make money using their Amigas and won't begrudge the cost of the board and monitor. At £400 the FlickerFixer is not the most expensive part of a system which will probably include a laser printer, plotter and hard disc.

REPORT CARD

FlickerFixer
Microway
£401.35

USEFULNESS
The Flickerfixer makes the high res interlace modes useable, extending the Amiga's power as a graphics tool.

EASE OF USE
Just plug it in and go, but it needs an Amiga B2000 and the right monitor.

SOFTWARE
No special software is needed. The FlickerFixer will work with any which supports interlace.

SPEED
With full screen double buffering in hardware it is just possible to see a delay when a sprite is moving rapidly.

VALUE
A very expensive peripheral of use to quite a small number of professionals.

OVERALL 68%

There will be some people who will rush to buy a FlickerFixer. Most will just add it hopefully to the Christmas list.

AMIGA Letters

Language problems

COULD you tell me what language to program in, either C or machine code? I have had very limited experience using a 6502 system at college. This was using a very small system without header files or a linker. I am reluctant to learn a whole new language. Whichever you recommend, which compiler or assembler should I buy?

David Evans,
Basingstoke.

This is really one for the Amiga Answers pages. AmigaDos takes some mastering and doing this from assembler is probably too difficult for a really raw beginner.

Try C first, in which case Lattice or Manx C are the two favourites for Amiga owners. If you are brave enough to try assembler you can't beat Devpac from HiSoft (0525 718181).

Broken or virused?

FOR more than a year now I have been the owner of an Amiga A500 and have been trouble free except for the last two or three months when a local dealer was most helpful in trying to solve the problem of freeze-ups, first by running the machine at his premises for a full day, but being unable to duplicate the problem.

We also tried a change of power pack and a new monitor cable, but neither had any effect – I was still getting the freeze-ups at home. We eventually came to the conclusion that my mains power supply was the culprit, even though I had a power cleaner in the circuit.

Then in June I went to the Commodore Show where I bought a copy of the latest Jumpdisk, which had a virus checker. Mainly out of curiosity I ran the program and checked a couple of my discs.

To my horror I found that they were infected with the Byte Bandit virus.

After checking all my discs I found that 75 per cent of them were likewise affected. Using the simple virus killer in the program I healed them all, including 10 commercial ones.

Since I now have a clean bill of health I have not experienced any further freeze-up problems. I heartily recommend that anyone with similar problems check their discs.

The cretin who instigated the virus in the first place is obviously a nut case or has a massive chip on his shoulder. He should put his talents to better use in being constructive rather than destructive in trying to destroy our pleasure in using such an excellent machine.

D. Froggatt,
London WC1.

The full list

IN response to your challenge to find another message hidden in Preferences, I hereby produce a list of what are hopefully all 10 messages.

Caryn and =RJ= LOVE 4 EVER
INTUITION by =RJ Mical=
Software Artist Deluxe
Preferences written by Barry Walsh and John Prince.
Dedicated to Penny Ridell with all my love Jon Prince.
Watch out for more software from Barry Walsh.
Carl EXEC Sassenrath reminds: All things are in Flux!
Luck Trucking Dale, We are the Champions.
To the original Amiga crew! We ARE the busy guys! We win.
Salute to Commodore-Amiga, folks who made this machine.
Many thanks to Judy Braddick for Diskcopy & Info.

These were found by loading in Preferences, then running a Basic program which converted the Ascii codes in memory into characters displayed on the screen. Having produced the messages in such a fashion, I have no idea how to obtain them from Preferences. But then I can't even get the two published examples to work!

C.J. Cregan,
Putnoe.

Thanks for your list – the competition is now closed. I'm sending you a copy of Sentinel as your reward – Ed.

Write to: The Editor, Amiga Computing, 78-84 Ongar Road, Brentwood, Essex, CM15 9BG. We'll send the writer of the best letter each month a program from our goodie drawer.

Chock-a-block buttons

I COULD not get any response from the active mice presses given in Guru's Haunt in issue 1, but here are a couple that work on my A500 with 1.2 Preferences. Taking the buttons from left to right as 1,2,3,4 click on:

3,2,4,2 4,3,2,2 3,2,4,2 4,3,2,2 then change printer, OK and reset colours.

A second combination is:

1,2,3,4 1,2,3,4 1,2,3,4 1,2,3,4 then select change printer, and click on

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AMIGA Letters

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the up arrow of the printer selection menu until it runs over the top. Hey presto, another message in the title bar.

I know who =RJ= is, but who's Caryn?

**Paul Corrigan (The Datel Cowboy)
Glasgow**

Thanks for those tips. Caryn Havis, manager of third party software support at Amiga, was =RJ= Mical's girlfriend when the program was written. She is now Mrs Mical. I'm sending you a copy of Bard's Tale to practice your exploring abilities on – Ed.

Expensive Amiga

AT last a decent British mag for the Amiga. I have only had my Amiga 500 for a short space of time but already I have become frustrated with several things. One is the need for expansion.

If you want to do anything but play games on it – a second disc drive and extra ram are essential. Also the associated paperwork is expensive – books on the machine's operating system and what makes it tick. The American volumes are prohibitively dear for the backstreet programmer, wasteful in paper and difficult to read.

I use an IBM mainframe and micros at work, my current interest on the Amiga centering on ray-tracing which I find totally fascinating and well supported on the Amiga.

**L.J. Martin,
Skelmanthorpe.**

Fit for business

HAVING recently bought the A500 business pack I was disappointed to find that the transformer was very slow – especially for compiling – and was only text based. As I am a student I am used to the MSdos-based PCs I operate at the poly.

Since the transformer is inadequate I am thinking of buying the XT or AT cards. How much basic memory is available with the board and can it be used when the board is not in use?

Can the 5.25in drive supplied with it be used separately as an external drive? Has the board got CGA and or VGA as standard or are they extra? Will the board attach directly to the Amiga?

**AB,
Dewsbury.**

You are going about things the wrong way. Buy whichever compilers you need to run under AmigaDos, not MSdos. You cannot use the XT or AT cards with the A500 – it needs the slots in the A2000.

The AT card is not yet available, but the PC card comes with 640k. There is some overlap with Amiga memory but I don't think you can use PC memory.

The XT card runs as an Amiga task so you can use both at the same time. It emulates CGA, albeit slowly. VGA is a PS/2 graphic standard and it would be very expensive. You are better off with the Amiga graphic modes.

All in all IBM made a botch job of the original PC, so don't try to downgrade your Amiga to it – Ed.

Software pricing

MY complaint is about the price of software for the Amiga 500. I can hear you say "not another one", but please read my letter as I feel it affects a lot of parents.

I have two sons: One is 13 and the other 9. My elder son started on the Vic 20, and after a couple of years upgraded to the 64. Now he wants an Amiga 500 for Christmas. He knows it will be a great machine as he has been reading about it since it was first reviewed. He managed to use an Amiga 500 which belongs to his uncle for a week, and now he is completely hooked and can't wait until Christmas comes. It is going to take me all my time and effort to get the money for the Amiga 500 without having to pay those very high prices the software companies ask. My son does not just play games but likes to draw, play music, and he loves all the desktop publishing software.

I know that when you buy an A500 you get Deluxe Paint with it. My son has used it and thinks that DPaint is great. But he has read the review of Photon Paint in your magazine and thinks that it would be a great art package. But at £69.95 how am I supposed to be able to afford this kind of software?

Most of the other utilities are in this price range. It will be hard enough to find £24.95 for a good game let alone those other items. The Amiga is a great machine, but what is the use of having it if you can't buy the software?

I know you are thinking "there are games for £9.95", but most of these games have been done on the 64 and all you are really getting is a bit more music and some extra graphics – most of the game is the same. So software houses please take note and make life cheaper for ordinary working people.

**William Nearly
Westlothian**

Software pricing is always contentious. Part of the problem is the number of customers. Commodore sells over a million C64s every year while only 600,000 Amigas have been sold world-wide. C64 software is also much cheaper to develop. A single programmer can still knock out a game on his trusty 64, but on the Amiga, software tends to be developed in teams. If you look at the House Call features in Amiga Computing *you will see how many people it takes to put together a good game. It also takes much longer.*

So with fewer customers and more programmers games really are more expensive to produce. There is good, cheap stuff in the Public Domain. Look at the ads in this magazine, or contact George Thompson Services on 077 082234.

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Q *Can you change the startup-sequence of a disc, so the disc doesn't automatically go to the S directory and the startup-sequence? Instead can you make it go to the X directory and file Y?*

A Yes and no. You can't stop the boot disc trying to load startup-sequence from the S directory, but you can edit it. This means that once startup-sequence has been run it can be made to switch to file Y in the X directory.

With a multi-tasking machine like the Amiga this is incredibly useful. It lets you define how things are setup. Ideal things to have in your startup sequence are the commands to copy the C directory to ram disc and to run any programs which you want to have in background.

Q *I have heard that I can make my A500 faster by adding a 68020 processor. If I do this would it make a noticeable difference and would my software, mostly games and DPaint I still work?*

A Adding a 68020 is very expensive. CSA and Hurricane make add-on boards but they cost thousands of pounds. The difference is noticeable, with different effects on different products. If they are properly written they should still work. The 68020 is not the same shape as a 68000 and so won't plug straight in.

The 68010 *is* "plug compatible". It costs about £50, although you should remember that fitting one will invalidate your warranty. Some things will run a bit faster, notably anything which is maths intensive.

The 68010 has an instruction cache – a bit of memory on the chip. Thanks to the cache the chip can run some sections of the program very much faster. A short loop will whiz along because the 68010 doesn't have to access main memory as a 68000 would.

Unfortunately this can lead to some problems. A very bad programming technique is known as self-modifying code. This is a method by which the program changes itself as it runs. If the change is made to a bit of program which is in the cache the processor won't know about it and the program can get into a real mess.

Very few programs are this badly written – it is usually only necessary for protection routines.

The main reason for upgrading the processor is to run at a faster clock speed. This is not possible with the Amiga because the custom chips could not cope with the higher speed.

We would advise against buying a 68020 unless you really know what you are doing. The improvement gained by adding a 68010 is in the region of 7 per cent and this has to be weighed against the cost of the chip and possible, albeit unlikely, incompatibilities. For details of the 68020 boards contact The Amiga Centre Scotland on 031-557 4242.

Q *I have heard about a new 64 colour, half bright, mode. Does this provide sprite handling, scrolling and the like or is it "useless" like Hold and Modify (HAM)?*

A Firstly we disagree that HAM is useless. A couple of programmers are experimenting with HAM games and there have been some great scrolling demos – and you can have sprites. Photon Paint uses a sprite for its cursor. Ray-traced images in HAM look great.

The half bright mode is a standard, non-serial mode. It adds a bit plane which the Fat Angus chip can use to change the brightness. All 500, 2000 and many but not all, 1000 owners have either added or bought machines with half bright capability. As with everything computery, half bright is a trade-off. There is a noticeable speed overhead caused by the extra bit plane which many programmers do not feel justifies the slight graphical improvements which can be gained by having 64 colours instead of 32.

Q *Can you explain an interrupt? And what books do you recommend on beginning assembler?*

A A computer has to look after its own functions while it is running your program. Think of it like this: While you are reading this magazine your body is remembering to beat your heart to pump blood, breath, sweat to keep you cool and digest the Big Mac and large fries you had for lunch. These things have to be done in addition to all the reading jobs for looking at this page and decoding the letters.

The computer has similar essential tasks: Refreshing the ram, drawing the screen and looking to see if a key has been pressed. These are held in a list known as interrupts.

A programmer can add one of his own jobs to the list, so that every time the screen is re-drawn his spaceship is moved one pixel to the left. These techniques are fine for games programming, but if the program has to multi-task there is a better method. This is to use the operating system to look after the task.

This is all quite complicated – and not for the machine code novice. For this reason we would recommend that you learn C before progressing to assembler. Have a look at Inside the Amiga with C from SAMS. You can get a copy for £19.95 from Computer Manuals (021-706 6000). They have a good range of Amiga books – ask them to send you a price list.

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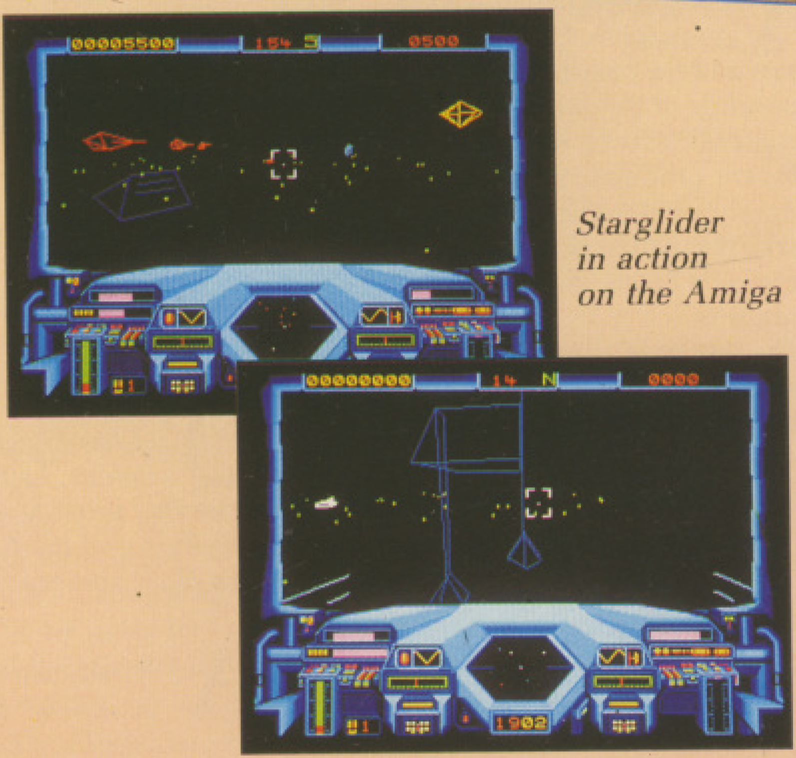
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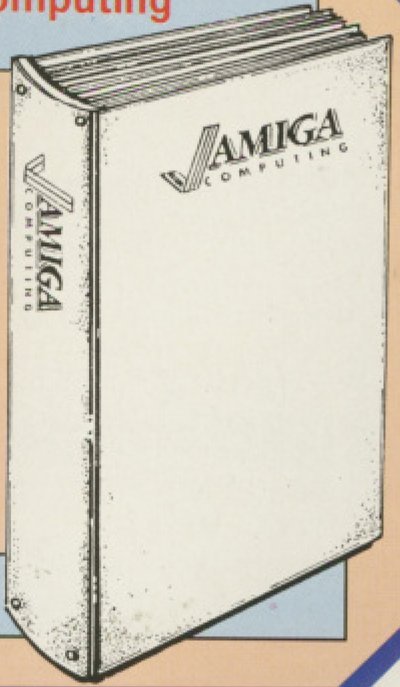
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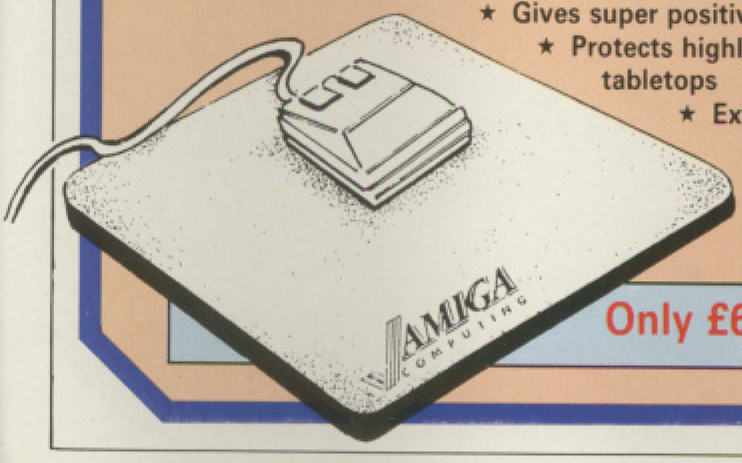
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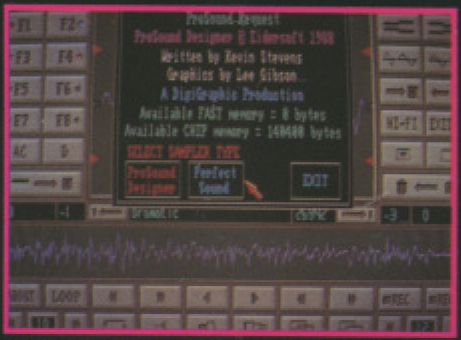
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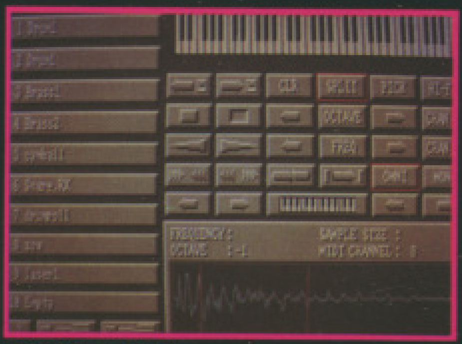


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